

DECEMBER, 1954

BUTANE-PROPANE

News

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and through the Year
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GAS OF HIGHEST QUALITY

WARREN PETROLEUM CORPORATION • Tulsa, Oklahoma

DECEMBER 1954

BUTANE-PROPANE

NBP

News

VOLUME 16 • NUMBER 12

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Executive

Jay Jenkins, President and Publisher
Paul Lady, General Manager
Bert Hill, Circulation Manager
Gilbert Bowman, Advertising Manager
Gene Masters, Research

Editorial

CARL ABELL, EDITOR
Lynn C. Denny, Associate Editor
William W. Clark, Editorial Director
Harold C. Hood, Field Editor
Lester L. Luxon, Technical Editor
Beverly T. Watkins, Assistant Editor
Raymond A. Grote, Art Editor

Publication Office

Los Angeles (57)—198 So. Alvarado St.
Phone DUnkirk 7-4337

Advertising Offices

New York (36)
527 Lexington Ave., Room 305
Peter Wile, District Mgr.
Phone PLaza 3-1838

Chicago (1)—333 N. Michigan Ave.
Wm. O. Dannhausen, District Mgr.
Phone FRanklin 2-4615

Cleveland (15)—1836 Euclid Ave.
Frank J. Enright, District Mgr.
Richard L. DeMuesy, Asst. District Mgr.
Phone PRospect 1-4584

Tulsa—P.O. Box 4055
Craig Espy, District Mgr.
2441 E. 25th Pl.—Phone 7-9807

Los Angeles (57)—198 S. Alvarado St.
Joseph R. Geryk
Phone DUnkirk 7-4337

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LETTERS



Don't Interchange Tanks

Missouri

We would appreciate information on whether or not it is permissible to change a tank that has been used with ammonia and use it for propane gas. If so, what are the requirements to make the tank safe for use?

The customer has a 1000-gal. ammonia tank, and wants to use it at his home as a propane storage tank. Without cleaning out tank, I understand the mixture will make a toxic gas which would be dangerous.

W.C.S.

The practice of placing L. P. gas in a tank previously used for the storage of anhydrous ammonia, or vice versa, has always been discouraged, because toxic and/or corrosive gases can be formed when L. P. gas, contaminated with anhydrous ammonia, is burned.

A tank should be well washed, rinsed and dried to remove any traces of ammonia and water before any L. P. gas is placed in it. The steel excess flow valves, relief valves, etc., are satisfactory for L. P. gas, providing they meet all the requirements of the L. P. gas codes.

Local and state codes should also be consulted to be sure there is nothing to prohibit the above practice.

Elsewhere in this issue you will find a special editorial section discussing anhydrous ammonia, one article of which deals with safety problems.—Ed.

Effect of Water in Systems

Pennsylvania

Can you supply us with or refer us to an authoritative report on the effect of water in L. P. gas cylinders and tank systems.

We are particularly interested in the problem of freeze-up of valves during winter operation and wish to establish the maximum quantities of water or moisture which can be tolerated without adverse effect on operation of the system.

P.B.M.

We do not know of any authoritative report that advises in exact quantities the amount of moisture that can be tolerated in L. P. gas cylinders or tanks. There are so many factors which will effect freeze-ups, including the size and design of the regulators, rate of withdrawal from the cylinder or tank, pressure reduction through the regulator and many others,

that it is questionable if any set figure can be established.

We do know that the quantity of water that can cause trouble may be very small. L. P. gas is peculiar in its ability to carry more water as a vapor than it will as a liquid. Therefore, if the vapor leaving the cylinder is chilled and some condensation takes place, water will separate and freeze if the temperature is low enough. The ambient temperature need not be below freezing to cause a regulator to freeze. Reduction of temperature is caused by the expansion of gas from a high pressure to a low pressure. (See Tables 1, 2, 3, and 4, page 323, 1951 edition, "Handbook Butane-Propane Gases.")

A short resume on "Regulator-Freeze-Ups" is included in the same handbook on pages 322 and 323. This may help you reach a suitable answer to your problem.—Ed.

Propane and Orchids

Tennessee

I have a customer using propane to heat a flower room in which he raises orchids. This room is 15x23 with a glass roof approximately 6½ ft high. We are heating it with a thermostatically controlled forced air floor heater with 67,500 Btu input, and fully vented.

Unfortunately, all the orchids he has tried to raise in this room have died and after laboratory tests they seem to have died from respiratory circumstances which he attributes to propane gas.

He has a friend with an identical setup but using natural gas. After moving his flowers to his friend's house, they grow fine.

What has been your experience using propane for this type operation? Would propane kill flowers and natural gas not? I will appreciate any help you can give me on this.

G.T.S.

It has been known for some time that products of combustion are harmful to orchids. The effect, however, has not been restricted to any one fuel such as propane. And the products of combustion are the same with propane as with natural gas.

It is more likely that the vented heater your customer is using is spilling products of combustion into the room. This may be caused by one or more of the following conditions:

1. There may be leakage through the heat exchanger which permits the products of combustion to come through into the circulating air stream.

2. The draft in the vent may be restricted and products of combustion are spilling into the room from the draft hood.

3. If the room is very tight and the air for combustion comes from the room, then the products of combustion would quite likely spill into the room.

We know of a case where a greenhouse of young celery plants was nearly ruined by heaters burning inside with inadequate ventilation. The room should be ventilated even if the heater was so connected that it receives air through a duct from outside and the products of combustion are vented.

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Write for additional information.

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*Philgas is the Phillips Petroleum Company trademark for its high quality LP-Gas or bottled gas (propane, butane).

**PHILLIPS PETROLEUM
COMPANY**

Sales Department • Bartlesville, Oklahoma

An air inlet vent having at least 1 sq in. of area for every 1000-Btu heater capacity should be provided to admit air to the space from which the heater burner obtains the air for combustion.—Ed.

Metal Heating

Quebec

There is a copper mine development in our vicinity and we have sold them all equipment for cooking and water heating.

As they have no electricity yet we are wondering if they could not use propane gas industrial equipment to heat their metal. They have mentioned something about it but I did not go further on the subject because I had no information and, besides, I thought that if they would come to use propane for their industrial needs they would get their own storage tanks and buy gas by carload.

Now we are up to the point where a bottling plant would pay for itself in one year if there would be any possibility of selling them propane for their industrial needs. We would build this plant close to them in order to supply them from our storage.

We would appreciate very much all the information you can give us on the subject or your referring us to some company which sells the equipment for such a purpose so that we could see our chance to get those people to use a large quantity of propane gas.

P.P.C.

Propane has been used for a great many industrial purposes, including the copper industry. We can see no reason why it will not do a very satisfactory job for your prospect, and probably much more economically.

We refer you to our "Handbook Butane-Propane Gases," Part 6, Chapter 5, p. 232, which includes a general discussion of "Industrial Applications For the Utilization of L. P. gas." Also, Booklet No. 8 of our series, "Operating an L. P. Gas Business," has several descriptive articles which should prove helpful to you.

Nearly any work in the copper industry which requires heat can be done satisfactorily with propane. Such applications as roasting ore, melting, refining, billet heating, warming ingot molds, drying, annealing, atmosphere generation for bright annealing, shop maintenance furnaces and ovens, heat treating, and many other processes can be economically handled with L. P. gas. Furnaces and ovens may be obtained with complete automatic control of temperature, furnace atmosphere, and cycle control if desired.—Ed.

Vaporization

Virginia

In figuring the amount of vapor we can obtain from various sizes of bulk tanks for use in the summertime on tobacco curers, I have arrived at some

theoretical rates of vaporization, but am not satisfied that they are correct.

Assuming the relative humidity of 35%, outdoor temperature of 60°, a constant rate of withdrawal (once curers are turned on they do not fluctuate like most loads) and using straight commercial propane in 500-gal. tanks, measuring 103 in. long and 41 in. in diameter and 1000-gal. tanks, measuring 192 in. long and 41 in. in diameter, with spherical heads, I find the following rates of vaporization will obtain:

Size Tank Gallons	Percent Filled	Btu Output
500	10	190,000
500	25	275,000
500	50	425,000
500	80	700,000
1000	10	375,000
1000	25	550,000
1000	50	750,000
1000	80	1,250,000

It would be appreciated if you could check these figures and advise what your calculations would indicate.

J.G.C.

We have checked the figures which you have listed in your letter and believe that in general they are conservative and should prove satisfactory for your application.

The only question in our mind is the 60° minimum temperature which you have used. Will this be maintained in the early morning hours? This is when the load will be the heaviest, generally speaking. This is the period of the day that may prove most troublesome.—Ed.

To Heat a Swimming Pool

Oregon

We have under construction a municipal swimming pool which they plan to heat with oil burning boilers. This pool is 60 x 120, ranging in depth from 3 to 10 ft. The incoming water will have to be raised from a minimum of 45° to 70°.

Fuel oil of a grade such as standard P. S. 300 will cost approximately 9.2 cents per gal. delivered to consumer storage. Propane in 1000-gal. lots will sell for about 16 cents. We know that we cannot compete on a fuel cost basis, but we have been told that some areas are using propane on similar installations, and we are wondering how they do it.

J.B.

Yes, L. P. gas is often used to heat the water for swimming pools. There are many factors which may give L. P. gas a break, coupled with good salesmanship, and make it the economical fuel to use for heating the water in swimming pools.

1. Often the boiler burners demand a better and more expensive grade of oil

than the P.S. 300 mentioned in your letter. (Pacific Specification 300 is comparable with No. 5 oil.)

2. Dealers in other areas of the country may be able to sell L. P. gas at lower prices than the 16 cents mentioned in your letter.

3. The cost of handling, pumping, heating, atomizing and equipment maintenance are often overlooked when comparing the costs of fuel oil vs gas. Most combustion engineers estimate that it costs 1½ to 2 cents per gal. to perform the above services. Therefore the true price of the oil at the burner tip is 10.7 or 11.2 cents per gal. instead of 9.2.

4. Oil should perform as efficiently as gas on a small boiler if the boiler burner, boiler tubes, etc., are well maintained and kept clean. There is little to go wrong with a gas burner and it supplies a clean flame and little or no ash, dirt or soot is deposited on the boiler tubes. This is not the case with oil, especially with the heavier P.S. 300. The burner may soon become dirty, poor atomization and combustion take place, ash and soot accumulate on the boiler heating surfaces so that heat transfer and efficiency is reduced. Some oil actually is not consumed when the burner becomes dirty or gets out of adjustment. Generally the oil fired boiler is not maintained on such a high standard and therefore the gas fired boiler will operate more efficiently over long periods of time.

5. However, you have a big obstacle with the wide spread in prices since oil is much higher in heating value per gal. than propane. Propane contains about 92,000 Btu per gal., vs about 145,000 to 150,000 Btu per gal. for P. S. 300 fuel oil.—Ed.

Protection Against Frost

Texas

We have a problem with which you may be able to help us. This is in connection with a planned frost protection device being developed. The customer has in mind a revolving set of burners. These burners, of course, will consume a great deal of fuel. The customer estimates that the consumption will be at least 100 gal. of propane an hour. Now our problem is as to what type, if any, heater will be required? The atmospheric temperature is 25° F. The pressure desired at burner head is 40 lb.

If possible, please advise me what type of regulator is required to allow the flow described above; namely, 100-gal. propane an hour, 40-lb pressure, atmospheric temperature 25°. Also, advise if any type of heater may be required to prevent freezing up due to rapid vaporization of the L. P. gas.

A.A.M.

The consumption of 100 gal. of L. P. gas per hour for an hour or more will generally require a vaporizer or the use of liquid type L. P. gas burners, unless the tank is large (several thousand gallons) or the usage is for very short periods of time. A small tank (1000 gal. or less) would be unable to supply vapor at 40-lb pressure for more than a few minutes.—Ed.



season's greetings...

To our many friends throughout the industry
We extend
Our sincerest wishes for a
Merry Christmas
And a Prosperous New Year.

TULOMA GAS PRODUCTS COMPANY

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Beyond the Mains

TEXANS ARE NOTORIOUSLY GREGARIOUS. That's just a bigger way of saying that they enjoy getting together and visiting. Which is not a bad idea, particularly if something constructive comes out of the visiting, such as the recent developments at a meeting of District 8 of the Texas Butane Dealers Association.

E. O. Sharp of Smithville, an ardent exponent of safety, had been favored with a visit by dealers from neighboring towns. While looking around the plant, the visitors had inquired, "How come, Brother Sharp, that with all your emphasis on safety, we discover in your own plant the following hazardous conditions?"

1 - - - - - 2 - - - - - 3 - - - - - ."

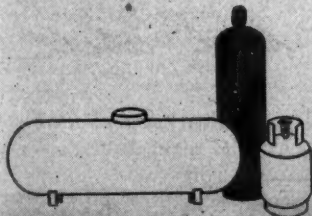
You can imagine Mr. Sharp's embarrassment. He could have been mad; instead, he became distinctly thoughtful. "My neighbors helped me," he mused, "by pointing out that I had been hibernating with hazards. If it could happen here, it might happen at any other plant."

So at the next district meeting of his association he presented his plan -- let's have an organized program to help each other find and correct the conditions in our plants that might lead to accidents.

THE SHARP PLAN OF PREVENTIVE INSPECTION is taking shape. Work is progressing on a standardized check sheet to aid the visiting teams in making a thorough check -- anything less would be a waste of time. No dealer will be visited against his will. Inspections will be made only on invitation of the proprietor.

THE PROGRAM WILL BE TESTED IN DIVISION 8 of the Texas Butane Dealers Association. We predict that it will not stop there. We believe that it should be carried wherever L. P. gas is sold. Effective policing of our industry is the best defense against restrictive regulation by government authority.

And we hope that a suitable medal will be embossed on Texas rawhide, and presented to Mr. Sharp with appropriate ceremonies at the next big meeting of the Texas Butane Dealers Association.



Continued ...



SHOULD THE L. P. GAS DEALER SELL AMMONIA?

For the past two or three years L. P. gas dealers, concerned over unbalanced seasonal loads and looking for some means of augmenting summer activities, have been asking whether or not they should branch out into the anhydrous ammonia business. There is no one answer to that question that will hold up in all cases. It must be answered individually for each operation, after a careful study of the facts for and against.

We find that several of the strongest LPG operators in the country have opened up ammonia departments and that these have done very well. An equally impressive group has made careful investigations of the possibilities and the necessary changes and additions to its plants, facilities, and personnel, and has decided that it is not for them.

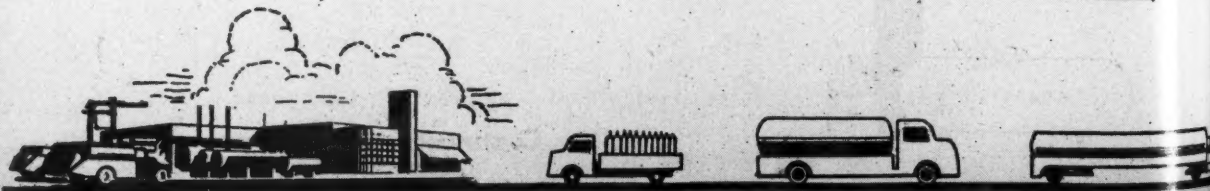
THERE ARE MANY FACTORS ASIDE FROM THE FACT THAT THE AMMONIA BUSINESS IS SEASONAL, and that the peak demand comes at the time the demand for LPG is lowest, that need to be taken into consideration. For example, the storage and transportation equipment are not so readily interchangeable as they appear to be at a casual glance.

Ammonia is a specialty. Its successful marketing requires a background of technical information that takes time to acquire. Additional investment of considerable magnitude is needed to handle business in volume. Adequate major storage for off-season production volume is not available, and so far we know of no off-season demand that can take up the slack.

FOR THE ASSISTANCE OF OUR SUBSCRIBERS who wish to investigate the possibilities in connection with their own operations, we are presenting (beginning on page 61 of this issue) a special section dealing exclusively with ammonia. In this section we undertake to present the complete picture, giving the favorable and unfavorable considerations impartially. In the preparation of this section we have sought and received both guidance and help from the Agricultural Ammonia Institute, as well as from representative producers of ammonia, manufacturers of ammonia utilizing equipment, and retail marketers of the product.

Ammonia offers attractive opportunities now, with an outstanding future, if . . . The subject is worthy of serious consideration by any L. P. gas dealer or distributor operating in an agricultural area. We hope that the material presented in this issue will guide you to the decision that is correct -- for you.

Carl Abell



So that LPG dealers may acquaint themselves with some of the major industries that offer substantial utilization potentialities, Butane-Propane News next month will launch a series of articles prepared by an experienced gas sales engineer. Entitled "Know Your Industrial Gas Markets," the series will provide information on the processes involved in each industry, the approximate volumes consumed, and the types of gas-burning equipment required.

Are You Getting Your Share Of the Industrial Markets?

By F. W. Commins
Calor Gas Co.
San Francisco

The selling of industrial accounts should not be a hit-or-miss affair but should receive the same organized effort that is expended to capture the domestic market. Industry provides a large and profitable area of operations.

THE advantages of L. P. gas as an industrial fuel are widely recognized. Almost every gas distributor serves at least a few accounts in this category. But there is seldom any continuous effort put forth, or definite allotment of salesman's time devoted to solicitation of industrial accounts. Therein the distributors are missing one of their largest, most desirable, and most profitable markets.

Representatives of competitive fuels often do a very good job of finding and selling these industrial outlets. As an example, several years ago, in a small town in the Pacific Northwest, a local gas dealer received an inquiry from one of the small industrial plants in his town about the use of gas for treating steel. This company was using an oil bath process for drawing and hardening small steel parts. The oil bath was in a tank about 3 x 4 x 3 ft, and was heated above 550° by means of an oil burner located under the tank.

Close temperature control of the quenching oil was needed for two reasons: first, the desired degree of hardness could be obtained only by quenching at a certain temperature, and second, if the oil bath got too hot, there was considerable fire hazard from the vapors escaping over the top of the vat.

Oil heat had not done the job satisfactorily, particularly since the burn-

er was not equipped with any automatic control. Gas equipment with complete automatic controls was substituted at very low expense, resulting in improved quality of the product, saving of time in bringing the bath to the correct temperature, and reduction of fire hazard.

As this manufacturer became more familiar with his problem and his equipment and learned more about the relationship between the temperature and the tempering action, he changed the unit to a salt bath, and later to a dry oven type of treating unit. The necessary changes in design were inexpensively made, and in each case the gas heat and automa-

tic controls were readily adapted to the requirements of the process. Control was accurate, heat-up time was short, and the system was completely safe, having both thermostatic control and 100% safety pilot. Gas lends itself to inexpensive changes because the original equipment cost and the operating cost are both low.

A few weeks after the initial setup had been installed, the L. P. gas dealer's field representative called to see that it was working satisfactorily, and to look for new applications for gas. In the plant at the time of his visit was the local manager of the big power company serving the region, accompanied by an industrial engineer from the power company's home office, trying to sell an electric furnace for this job, and for similar jobs that were to develop. The electric people did not sell their furnace, for several reasons that were explained later by the plant manager.

The first reason was that the gas people responded immediately upon his inquiry. They came up with the necessary suggestions that enabled the company to do a good job, inexpensively. Much of the reconstruction work was done by the owner's own personnel. Most important, the final setup worked, and worked inexpensively. Inasmuch as he had found it to be a flexible type of operation on gas fuel and also clean and safe,



Packaged units are available for many industrial applications and it is better to use them whenever possible.



With his 75-lb portable library, Woody Commins travels over 30,000 miles per year helping dealers sell and install LPG-consuming equipment.

A Word About Woody Commins

Woody Commins is an unusual man in many respects. He keeps his weight down by the mental exercise of acquiring information on the industrial, commercial and automotive applications of L. P. gas, and by the physical exercise of using that information for the benefit of the Calor Gas Co. dealers who need his help in selling and installing LPG-consuming equipment for those types of service. Between jobs he travels more than 30,000 miles per year.

Woody's brain is an encyclopedia of LPG information, all organized, classified, indexed and stored where any item may be found on a moment's notice. He is also an ardent disciple of the doctrines "one picture is worth 10,000 words" and "seeing is believing." He has assembled and carries with him another LPG encyclopedia of amazing proportions. This consists of nine loose leaf binders in which he has assembled vital engineering data and charts, reports clipped from trade magazines covering commercial, industrial and automotive installations, reports, testimonials, and photographs covering installations of outstanding merit which have not appeared in publications, and pertinent catalog data which may be useful in making sales. All of this material is classified and indexed for ready reference.

In addition, he has a backlog of books and manuals dealing with gas installations, including "Hand-

book Butane-Propane Gases" and the "Butane-Propane Power Manual." The entire portable reference library weighs nearly 75 lb. If the local dealer with whom Woody is working does not have sales information on an application that he is trying to sell, the chances are good that Woody can open a volume to the item indicated and show the prospect that the same thing has been done somewhere else with satisfactory results and a worthwhile saving. The customer does not have to accept a stranger's word for it.

The "Commings Constantly Increasing Encyclopedia of Clippings" has been growing ever since Woody entered the LPG business in 1939 as a trainee in the engineering department of the Ransome Co., Emeryville, Calif. Its value has been in direct proportion to its completeness. According to Woody, there is no point in locating and interviewing a prospect unless the salesman is in a position to convince him and close the sale, and do it with a minimum of experimentation and error. If someone else has had the experience, he wants to take advantage of it.

Besides being outstandingly effective in closing sales and insuring successful installations, published experience is amazingly cheap. For the small cost of a few magazines and loose leaf binders, Woody has built himself a selling tool of incalculable value.

he could see no reason for changing to the very expensive electric furnace suggested by the power company's engineer. Here is a case where the electric people did not get there first. And it is necessary to get there first.

How are you going to do this? The important thing is to have a clear idea of what to look for. We find that most dealers need help in this respect, so we supply all of our dealers with a check-list on which are arranged a large number of industrial applications which offer possibilities for the use of gas. Obviously, not every application is there, but the list contains a great many more suggestions than would ever occur to any individual salesman. It is to be used as a check list in guiding the salesman to local prospects. We hope it will be used, and used often.

It is also a good idea to take time out to go visiting once in a while. Visit the plants of your customers. Visit the other industrial plants in your operating area. Here is an example of how these visits sometimes work out—not in every case, but frequently enough to make them worthwhile.

One L. P. gas distributor, who makes a practice of visiting industrial plants in his area, received an inquiry about a small tool treating furnace. Upon the completion of this contact, the L. P. gas distributor decided to call on a customer at the plant next door who had a small 150-gal. tank setup.

There he learned that the operator of an adjacent plant which manufactured sprinkler system fittings made of aluminum was not too pleased with the results of purchasing from one of the major aluminum companies. He was a relatively unimportant purchaser and sometimes deliveries were not what he felt he would like to have.

The L. P. gas distributor called on the sprinkler manufacturer, and asked if he had ever considered making his own castings rather than buying them. The suggestion proved timely. Result: the sprinkler manufacturer purchased an aluminum melting unit and made his own castings.

The gas load in this case was only about 3 gal. per hour, but the unit was frequently in operation. So where there had been no load of this

type before, there was one now simply because an opportunity had been created.

It is interesting to note that a year later this operator had two units in operation. Naturally the gallon usage had increased.

The beauty of many industrial applications is that they can be served by packaged units that can be bought from manufacturers and readily installed in much the same way as the floor furnace or water heater. No special on-the-job engineering is required.

Another technique to use in going after gas loads is to divide and conquer. One dealer called upon a plant operator for a small application and while discussing this subject with him, noticed that in the 60 x 150 ft plant there was a large number of overhead steam unit heaters. A quick look did not suggest any other applications of steam that would make these heaters useful for other than cold-weather operation. The dealer asked, "What do you do with the boiler in the summertime?"

It Bubbles

The plant operator said, "We don't really have much use for it but we do have a couple of vats here that we run steam through."

It developed that these two vats, which were rather small, each containing perhaps 175 to 200 gal. of water, were used with a conveyor belt system for washing and rinsing castings after they had come from a machining process. The steam was used for heating this water. Here was rather a good sized boiler doing practically nothing during the warm-weather months except turning off and on, bubbling out a little steam to heat the water. The total load for heating the water in both vats was probably less than 200,000 Btu's.

The dealer suggested that gas-fired immersion tubes be used for heating the water in the vats, utilizing controls that would hold the water at the required temperatures for the two different processes. Now this alert dealer has a new, simple application for LPG, and the oil burning boiler is no longer used for water heating.

The loads are there waiting and they can be had. It is easier to sell a water heater or other conventional appliance, but one small industrial job will often use more gas in one hour than a domestic appliance will use in a week or even a month. A few good accounts might even out the peaks and valleys in our load.

To prepare for industrial applications of LPG, a dealer must learn something about typical industrial uses so that he will know a prospect when he sees one. In the following case L. P. gas could have had the radiator vat load years sooner if the dealer had been more alert.

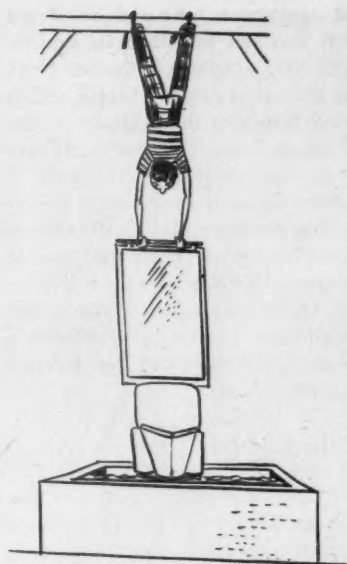
In one small town the operator of a radiator repair shop, whose radiator vat was heated by electricity, contacted the local L. P. gas supplier. This supplier's representative called at the shop and found that the shop manager wanted to change to gas.

Electricity was too slow and expensive. Very expensive, in fact, because the slow heating resulted in loss of customers. This shop did not require the radiator vat to be operating at all times but when a job did come in, the customer wanted it out quickly—the same day if possible. The electric vat could not work that fast. Jobs were in the shop for at least a day-and-a-half or two days, and the dissatisfied customer would take his business elsewhere next time.

The shop was located in an agricultural area and the load from tractors and trucks and such heavy-duty equipment was an important part of the shop's work. So in order to keep up with the work, the shop kept the electric vat hot all the time because it took so long to heat up. Electric units do not maintain their efficiency over long years of time and the longer they are operating the faster they lose their efficiency.

Can't Keep Up

A new vat of the desired size was built and two immersion tubes, each fired with a suitable size gas burner, were installed. Automatic controls were included. The only complaint that the operator of the radiator shop then had was that he had to work too fast to keep up with the vat. He was pleased when a job came in, and the cold vat could be turned on and in 30 or 40 minutes be up to temperature



When he used LPG the operator couldn't work fast enough to keep up with the radiator vat.

and ready to use. Ordinarily it required at least that much time to remove the radiator from the vehicle.

This load could have been acquired years sooner but the shop had never been called upon by the operator of the local L. P. gas concern. This and some of the preceding cases indicate the need for the check list mentioned earlier. A check list or something comparable to it should be used frequently. The potential jobs are there and gas can do them better.

Full use should be made of the material in trade journals and published books of the L. P. gas industry. There is always material indicating the agricultural, automotive, industrial and commercial possibilities for LPG.

In considering potential industrial loads, we should not overlook the jobs that belong to steam. Some of these jobs were intended to be done by steam and are done excellently by small packaged boilers. The list includes such items as lard rendering kettles, candy kettles, and small boilers for dairy sterilization, bottle and can washing, and for tire vulcanizing molds. Some of these are special units but others are small boilers specifically intended to be gas fired for the specialized jobs.

Shall we convert or sell new equipment? For an industrial application, selling new equipment, if there is a packaged job intended for

the application, should be done first. The fact that there is a packaged unit available indicates that the job has been done before and in many instances there are long lists of satisfied users of this particular piece of equipment. Much of the grief that is frequently encountered in converting existing units, which in themselves have been poorly designed, is eliminated by the use of the factory job. These factory jobs range all the way in size from a little plumber's furnace or a soldering iron furnace to a grain dryer.

In the Know

In the case of larger equipment, the manufacturer often has field representatives who will assist in the selling job. This has advantages inasmuch as they know more about the particular industry they are selling.

Where it is not possible to sell a new packaged job, and a conversion is the only alternative, we must beware of various pitfalls. Among the frequently encountered ones are simple jobs such as a rectangular vat used for water heating for some industrial or commercial application. The vat is usually filled with water to be heated somewhere from 100° up, and it may be presently fired by oil or some solid fuel. We are called upon to improve the process, stop the smoke, or speed it up. We install a gas burner of the best possible size and type.

Often times the results are highly disappointing. In searching for the reason why, we may find that because of the way the vat was constructed, it is possible to heat only the very bottom and not the sides. A lot of available heating space is lost and the hoped-for improvement is not attained.

In some cases there is too much space on the sides, between the vat itself and the outer jackets. The heat from the burners finds an outlet and goes out. A relatively cool layer or boundary line of stagnant heated air against the vat isn't rubbed off by products of combustion passing through, as is done by combustion products going through the tube of a water heater, which has a spinner baffle to cause the combustion products to wipe the wall of the immer-

sion tube and achieve a better efficiency.

In other cases we find that the gas burner is installed too close to the bottom of the tank. This results in poor combustion, floating flames, safety pilot going out and other results of poor combustion in the fire box.

So the job does not come up to expectations. All these things are found out the hard way. After much tinkering, the burner is either removed or left to do a questionable job. Conversions can be good, but they take know-how and learning. Packaged jobs are more likely to be better and less expensive to all concerned.

If conversions are to be made we should check a reputable manufacturer's catalog for standard construction and type. See how the job for conversion compares with a standard setup. If we are not too familiar with a job to be done and the setup does not seem to compare with conventional practice, it is wise to hold it up until we can find out more about it rather than spend a lot of time and end up with a poor conversion, later to be taken out at cost and dissatisfaction to everyone concerned.

Let us remember that gas is easier to control. So make equipment automatic from the very start. Controls do not cost; they save money every day for the user. There are representatives for the control manufacturers who are available to serve your area. Consult them and become better acquainted with their industrial controls. Let them help you, and your customer and prospect.

Types of Control

There are various types of controls for various jobs—electrical controls and non-electrical controls such as mechanical, hydraulic or steam-operated. Such controls may be process or temperature controlling, or may be for pilot only.

Basically there are the millivolt and electronic type and hydraulic or mechanical controls and there are very logical places for each, based on advantages and disadvantages. These should be kept in mind and complete familiarity achieved with each control.

The millivolt control operates on a

very low voltage created by the features of a pilot type generator. Its advantage—low cost. Its disadvantage—the application is limited. Of the more common controls offering good possibility for field application, this one is found very frequently in packaged jobs but used very seldom in the field. It is frequently misused or used beyond its normal range of application, and therefore criticized unjustly.

The full electronic type of control is found in high grade and larger burner equipment, both oil and gas. Advantage—quick response. Disadvantages—cost and complications.

The mechanical type of control has as its advantage a medium low cost. Its disadvantage is that response is only medium fast, rather close to that of the millivolt type when this is used as a safety control.

The Partlow is a commonly used type of industrial control both for safety and temperature application. Every industrial salesman should be familiar with it.

Ideal Fuel

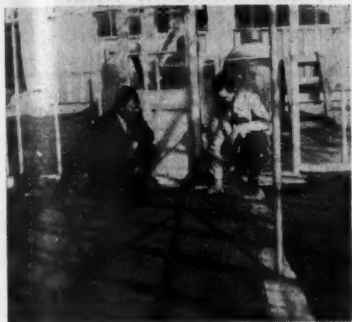
From the safety and temperature controlling standpoint gas is the ideal fuel. Because of the ability of gas to throttle delicately, mechanical controls can adjust automatically to just that firing level needed at any moment and hold it until process requirements change.

The possibilities for expansion of the industrial use of L. P. gas are far greater than has been realized in almost every community. It takes study and work to locate, sell, and develop these accounts, but this work is richly rewarding. Many of the applications are steady the year around, and some can almost always be secured that have their peak in the summer months when additional gas load is desperately needed. And for the most part they are located where they are convenient and economical to serve. Profit-wise they are frequently the best accounts the LPG distributor can have. Per manpower hour consumed in selling and servicing the accounts, they rate at the top of the list.

Adapted from a speech delivered before the Utah Liquefied Petroleum Gas Association annual convention, May, 1954.

Right: This 36 by 22 ft greenhouse contains approximately \$12,000 worth of grass. Thermometer, left center, records temperature of the soil.

Below: "Miracle grass" is examined in the greenhouse by H. R. Bridgewater and John Kraft of Suburban Propane. Company installed water heater to raise temperature of the soil.



LPG Turns Grass Green For Maryland Turf Farmer

LAST spring William H. Wilmot, a turf farmer in Gaithersburg, Md., was readying some of his grass for the annual Washington, D. C., flower show. His problem was how to bring this grass to its mid-season greenness in time for the show.

Suburban Propane Gas Corp. of Whippany, N. J., stepped in and solved Mr. Wilmot's problem for him. By laying pipe on the floor of the greenhouse and connecting it to a LPG water heater, Suburban brought the soil temperature up to 78°. In a few days the grass was a mid-summer green.

Summit Hall Turf Farm, which is owned and managed by Mr. Wilmot, is responsible for about half of the total production of a special strain of grass known as Meyer Z-52 Zoysia.

Oriental Zoysia

In 1906 the U. S. Department of Agriculture brought back from the orient a tough, long-rooted Korean

grass called Zoysia Japonica. After five decades of breeding and experimentation the department produced a strain of grass known as Meyer Z-52 Zoysia, which thrives in any weather, eliminates crab grass and weeds forever, is disease and insect resistant and requires little mowing. It can be used in clay or sandy soil and is truly a "miracle grass."

Because it can withstand heavy wear and tear the year around, this grass is excellent for children's play areas. Growing slowly aboveground, it requires little mowing. Stolons and stems of the grass creep along the surface, forming new plants as they go. Meanwhile, the grass builds an extensive root system that holds more moisture and therefore needs less watering.

Meyer Z-52 Zoysia has no seed. Two-inch plugs are cut from certified acreage and are introduced into existing lawns. A plug is planted in each square foot of lawn. The grass spreads rapidly, forming a dense, springy turf, and completely cover-

ing the planted area in two growing seasons.

Lots of Grass

Last spring, for the first time, Meyer Z-52 Zoysia was available in quantity. The 36 by 22 ft greenhouse at Summit Hall Turf Farm contains approximately \$12,000 worth of the miracle grass.

This was the first time a Suburban water heater installation was made to help grow grass. Suburban installed about 900 ft of copper pipe on the floor of the greenhouse and connected it to an 800 series Ruud radiator to provide the necessary hot water. The sod was laid over the piping on the greenhouse floor.

Thanks to L.P. gas, Mr. Wilmot's turf won a blue ribbon at the flower show. It also attracted several thousand visitors and prospective customers to his turf farm.

Adapted from Suburban News, May-July, 1954, published by Suburban Propane Gas Corp., Whippany, N. J.



Office and salesroom of Guadalupe Gas & Electric Appliance Co. in Sequin, Texas, where Lee Fielder's customer appreciation plan originated.

Are Your Salesmen Poor Prospectors?

Then consider the customer appreciation plan, a sales program calling for full use of customers in finding new gas and appliance prospects.

By Ruel McDaniel

SALESMEN have lost the ability to prospect for customers. Only 25% of today's retail salesmen are good prospectors and these 25% do 75% of the business.

This is the firm conviction of Lee Fielder, whose research and study of selling and human nature extends over a period of more than 30 years. He is head of Guadalupe Gas & Electric Appliance Co. and Guadalupe Gas Co. in Sequin, Texas.

Mr. Fielder has developed what he calls a customer appreciation plan, aimed at overcoming present-day shortcomings in salesmanship, particularly in retail business. The plan was tailored around his experience in the sale of butane appliances and, to a lesser degree, the sale of butane gas service.

The customer appreciation plan makes use of the practice of calling

on customers and asking for names of friends, neighbors and relatives who may be interested in buying similar appliances. Mr. Fielder's plan makes it monetarily worthwhile to the customer to help the salesman find new prospects, so it is not just a matter of the customer doing the salesman a favor. Under this plan, he does himself a favor too.

Prospects for Poor Prospectors

In creating additional prospects the customer appreciation plan overcomes the basic weakness in today's selling, according to Mr. Fielder. It gives the 75% of the salesmen who are poor prospectors a break by providing them with prospects.

Under the "pilot" plan used by the Fielder store in Seguin, the company made use of nationally-known trade

stamps as premiums to customers for providing leads to prospects, the stamps to be turned in for merchandise from a gift catalog. Under the completed plan, the company uses its own system of gift certificates and stocks its own merchandise premiums for customers who help in finding prospects.

The foundation of the program is the customer kit, which the appliance salesman gives to his new customer, at the salesman's discretion. Mr. Fielder recommends that a kit be given to every new customer who buys as much as \$25 worth of merchandise in his initial order. The plan particularly appeals to women, as Mr. Fielder has found by its operation in his own appliance store.

In the kit are folders and a reply card. One folder is aimed at selling the new customer further on the com-

Here's How the Customer Appreciation Plan Works

Salesman completes sale of new appliance. This customer will help salesman find new prospects.



Purchaser receives a customer kit and gift certificate in proportion to amount of purchase.



Customer thinks of friends who might be interested in new appliances, mails their names to salesman.



pany so that she will be glad to recommend it to her friends. The kit contains a list of premiums to be earned from certificates she will receive, based on purchases by friends whose names she supplies to the company. Also the kit usually contains a circular about something special currently being offered by the company, and a table showing the value of purchases in gift certificates.

The value of a purchase varies according to the net profit for the company represented in the sale. The average given to the customer for helping to sell other customers is about 2% of the selling price of the appliances.

The customer receives gift certificates on her own initial purchases as an inducement for her to help the salesman find new customers so that she may receive additional certificates based on the purchase of these prospects.

More Certificates

The owner of the customer kit finds a card in it listing spaces for names, addresses and telephone numbers of persons whom she believes might be interested in appliances; this card is self-addressed to be mailed to the company without postage. When one of these prospects buys something, the customer who furnished the name receives gift certificates in proportion to the amount of the purchase.

Mr. Fielder recommends that the salesman who delivered the kit also deliver the gift certificates earned. Thus he has an opportunity for further selling the customer on the value of helping him.

The cost to the salesman of the customer kit is \$1 and half the revenue from this kit goes into a "pot" for the purchase of premiums for customers.

Every customer kit bears a serial number and is charged against the salesman who delivers it. The registration also carries the name and address of the customer who receives it, so that there is a permanent and continuous record of the "earnings" of each kit in the hands of a customer.

Exclusive Franchise

Mr. Fielder has readied his plan for use by other butane dealers and eventually for retail dealers in many fields. The basis of the appeal to other dealers is that his customer appreciation plan, in effect, takes over the major sales management job for the subscribing dealer.

When a dealer subscribes to the service, he receives an exclusive franchise for its use in his normal trade territory insofar as his specific type of business is concerned. Only one butane dealer in an average city may have the service, but it is available to an automobile dealer, a plumbing concern or other non-competing concerns.

The first thing that a dealer does after subscribing to the customer appreciation plan is to supply Mr. Fielder with a list of his salesman, and with a brief history of each. Mr. Fielder then sends a questionnaire to each man directly, asking him to fill it out completely. This gives Mr. Fielder an appraisal of each man's good and bad points, and from there on it is a matter of his working with each man to

BPN field report

help him overcome his weaknesses, while supplying him with prospects through the customer kit plan.

Mr. Fielder is readying a monthly publication, which will go to all salesmen of subscribing dealers. The publication is aimed at spurring greater effort on the part of the average salesman while working individually with salesmen who need individual help.

When a dealer subscribes to the service, he sends to Mr. Fielder a list of all holders of the customer kits. Thereafter these customers receive periodical mailings, aimed at selling the customer on the dealer whose salesman supplied the kit, and on the desirability of earning gift certificates which may be turned in to the Fielder organization for premiums.

Trial and Error

Mr. Fielder's customer appreciation plan is something that he has fashioned through trial and error after use in his own operation, particularly in the sale of butane appliances. He and his son put the completed plan into full operation late last year.

As a result of the plan's use, volume the first half of 1954 was the highest in the eight-year history of the company. The plan snowballs, says Mr. Fielder, and the longer it is in operation, the greater benefits to be accrued. He believes the last half of this year will show a still greater volume increase.

Salesman follows up leads supplied by his customer, gives sales talk and sells appliance.



Additional gift certificates are delivered to original customer personally by salesman.



Original customer turns gift certificates in for premiums, supplied by salesman's company.





Favorable Verdict Expected In

"Trial By Disaster" For L. P. gas

A dramatic "trial by disaster" for L.P. gas under conditions of an atomic attack is promised in the recent announcements of LPGA officials that plans are shaping up for a full-scale participation of LPG facilities in the next continental A-bomb test at the Nevada proving grounds.

The fuel systems, which would be relied upon to step into the breach that would be caused by simultaneous destruction of city gas systems and mass exodus to the outlying communities, will be strategically placed at distances from ground zero that would be comparable to estimated distances of actual installations from presently known target areas.

Increased Activity

The intensification in the planning for the test is only one of several activities that are increasing in tempo as the L.P. gas industry coordinates its preparations for a vital role in civil defense. Regional and local organization is progressing rapidly. Federal CD officials are contemplating a mass feeding demonstration,

The acceptance and use of L. P. gas for civil defense purposes is growing rapidly. In May BUTANE-PROPANE News reported on an exhibit held in Maryland by the LPGA committee on mass feeding (see page 57). A few months later an actual mass feeding demonstration was held in Chicago (see Oct., page 118). At the recent American Hospital Association convention L. P. gas and equipment were an important feature of a government-sponsored emergency hospital exhibit (see Nov., page 122).

Below is a report on a new phase of civil defense activity for L. P. gas: LPG will undergo a "trial by disaster" at the next A-bomb test at Nevada's proving grounds. And for a review of the most recent mass feeding demonstration turn to page 40 of this issue.

with LPG doing the cooking. LPG is being seriously considered for use in 200-bed emergency hospitals, of which FCDA hopes to have 6000.

In the test, it is planned to install consumer equipment at various distances from ground zero out to the fringes of the area of devastation to

determine the degree of damage at specific distances. An important part of the test will be the construction of a typical bulk plant employing an 18,000-gal. tank. Present plans for its location indicate that this tank will be recoverable. It is most important however, to determine what may happen to pipe connections, excess flow valves, relief valves, compressors, motors, etc., and to look for effects that cannot be predicted in advance.

Bulk Plant Test

This installation will be representative of many bulk plants located adjacent to but out of the area of severe damage. It is necessary to determine the effect of the blast wave, the thermal flash and the radioactive fall-out on bulk installations at specific distances, and the effects of this test can be extended to encompass all distances involved.

"There is no better way to determine our true value to civil defense and to learn what safeguards, if any, we need to set up around our opera-





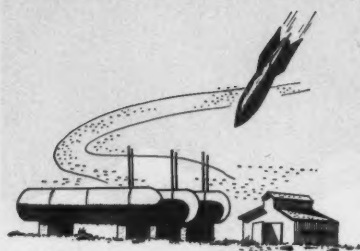
... natural guidance

It's natural for us to think of our customers and other friends at Christmas Time . . . and to thank you for helping us attain our best year.

To you we send the Season's Greetings and best wishes for future success and happiness. We shall look forward to a continuance of cordial relations with old friends and to the gaining of new friends during the year to come.

Sid Richardson
GASOLINE CO.

629 FORT WORTH CLUB BUILDING • FORT WORTH, TEXAS



It is important to determine what may happen to a typical bulk plant in case of atomic attack.

tions, and how quickly any damaged facilities can be made serviceable again," say LPGA officials.

This test, it is anticipated, will not only show the degree of dependence the government may place upon L. P. gas for civil defense purposes, but should also result in much valuable information regarding proper industry safeguards. From the test may well come data as to the advisability of stock piling L. P. gas appurtenances against attack, and a list of other possible applications of LPG for civil and military uses.

The tests are being planned by a special subcommittee of engineers, which has been appointed and has met with the Atomic Tests Operations office of FCDA. Preliminary arrangements are already under way for the industry to furnish L. P. gas equipment for test under an atomic blast at the Nevada proving grounds. Members of the industry will be asked to donate this equipment. At least one member of this subcommittee will be assigned to the staff of the Atomic Energy Commission and will be cleared to observe the tests and to receive an analysis of the findings. Other members are expected to be admitted to general observations of the tests and to have access to such test information as may be released by AEC.

Mass Feeding

FCDA also contemplates a mass feeding demonstration involving a large number of people in an area adjacent to the tests. This is planned as a public demonstration to be carried out under simulated disaster conditions. It is contemplated that all

industries capable of assisting in real disaster will be asked to participate. These will include the food, utensil, restaurant, catering and equipment industries, and perhaps others, and the L. P. gas industry. The LPG industry will be requested to convert or supply cooking and water heating appliances with related first aid or hospitalization adaptations and the fuel and equipment to operate them. This will take considerable planning and special committee activity. Good and conscientious workers will be needed.

Existing utilities, natural and manufactured gas, electric and water distributing lines, will be seriously damaged from the blast of atomic or hydrogen bombing, and it is anticipated that large numbers of the civilian population living beyond the area of devastation will be without fuel and power. With almost 100% of L. P. gas operating facilities outside of critical



L. P. gas will be used in first aid and hospitalization adaptations.

target areas, and widely diffused throughout the areas, it is almost certain that many of them would survive. Since a high percentage of existing feeding facilities already use gas for cooking, it would be simple for L. P. gas personnel to convert this equipment.

LPG is expected to be relied upon not only for mass feeding, but also for hospitals, schools, first aid installations, emergency housing, and for a wide range of power applications.

One emergency hospital has already been assembled and is on display at Temporary Building D in Washington, D. C., and 200 similar units are on order. An additional 90 units will probably be provided by a joint state-FCDA program under which the latter pays half. An ultimate goal of a minimum of 6000 units is contemplated.

C. J. McAllister, Parlett Gas Co., Waldorf, Md., a member of the

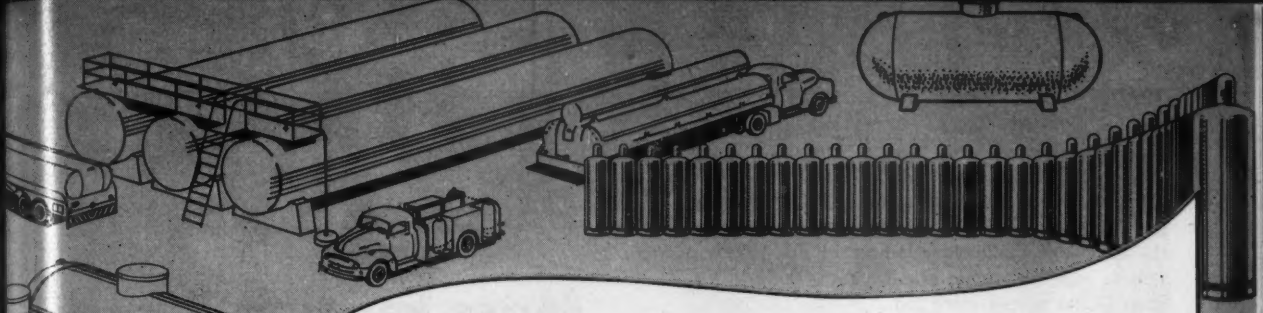
Committee on National Affairs, is also a member of the National Advisory Committee to the Mass Care Planning Welfare Office of FCDA. Through Mr. McAllister's work the desirability of using L.P. gas for these hospital units has been demonstrated, it being anticipated that each unit will utilize L.P. gas for cooking, sterilization, water heating and, perhaps, refrigeration.

CDA Praise

The Civil Defense Administration acknowledges that our industry has a product and uses a method of distribution uniquely fitted to serve the need. No other industry can serve in the same way or with the same efficiency. We will play a part vital to the welfare and defense of our whole nation if it is attacked. Since there is no way to determine whether or not there will be such an attack, preparedness is the only wise course.

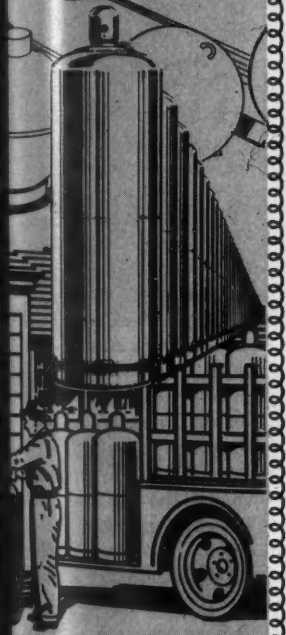
Meanwhile, organization on the local and regional levels is gaining momentum. With foundations of the national organization having been laid, state groups are beginning to form. Typical of the speed with which these units are moving ahead is the progress of the California segment of the industry in the past few weeks.

With Ralph E. Meeder of Meeder Equipment Co., Los Angeles, at the helm, regional LPG civil defense committees have been appointed for the 10 defense zones set up by the California CD authorities. These committees are working under the direction of regional CD coordinators. At present, operations are to be conducted under an "interim plan," the purpose of which is to "identify and plan for the integration of the resources of the liquefied petroleum gas industry into civil defense under a state of extreme emergency; to identify experienced personnel who . . . should be assigned to the continued operation of the industry during the emergency (and) to provide information through civil defense to the industry on the emergency conditions and needs and through the industry to (apprise) its members as to the services the industry will render during an emergency."



Announcing

FIVE YEAR FINANCING
for the purchase of LP-Gas
CYLINDERS and TANKS



Recognizing a vital need of the industry, LPG Credit Corporation offers a new, long-term financing service. It is now possible for qualified dealers to have the cylinders and domestic storage tanks on hand that are needed for a rapid and healthy business expansion, with a minimum capital investment. Additional tanks, cylinders and related equipment pay for themselves out of added income from new customers and bigger gas load.

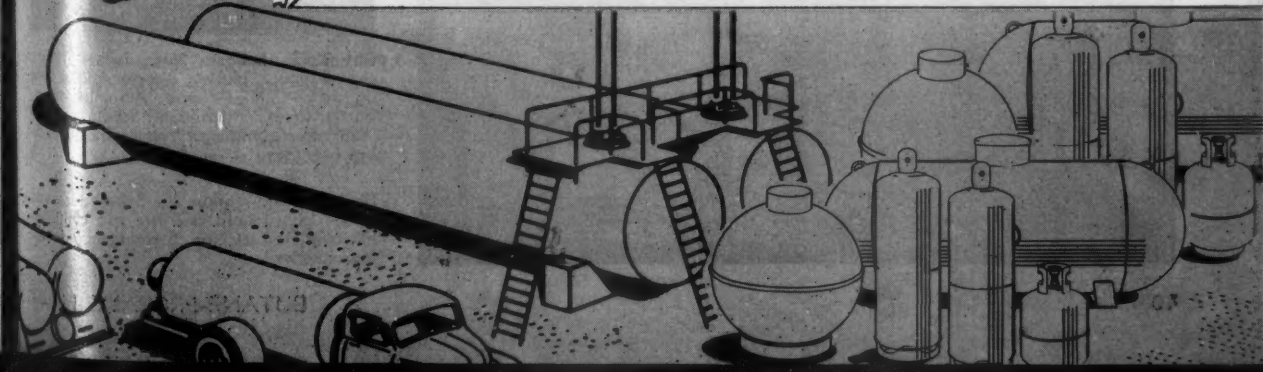
Financing the purchases of bulk storage tanks is also included in this five-year plan.

Inquiry on your company letterhead is invited.

LPG

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L. P. gas saved the day in all four locations of an exercise staged Nov. 6 by civil defense workers in Chicago. Quantity cooking expedited by L. P. gas appliances and equipment proved the answer to the mass feeding problem in case of atomic attack. More than 11,500 people were fed.

Under direction of Anthony J. Mullaney, director, Chicago Civil Defense Corps, everything was done the hard way, just as if utilities—city gas, water, lights and phones—had been knocked out by enemy attack.

At 8 a.m. 1100 volunteer workers moved into four widely scattered emergency stations. Two squads of L. P. gas servicemen, dealers and equipment men were assigned to each location; they unloaded cylinders, tanks, commercial and domestic type ranges. At the same time, civil defense workers began food preparations. By 10 a.m. cooking had begun. Promptly at noon, the food was ready for long lines of watchers who filed past the rubble ovens and LPG ranges. Tons of beef stew, beef and ham were served.

L. P. gas blow torches carried by industry service trucks were used to ignite wood fires built in improvised fireplaces of rubble and debris. Many of the trucks were radio-equipped for communication with their operating bases.

Five Chicago area L. P. gas deal-

11,500 People Attend Mass Feeding Exercise



Cylinder supply for L. P. gas ranges used during mass feeding exercise in Chicago is checked by Ralph Engstrom, Bastian-Blessing Co. Food was cooked on ranges and make-shift stoves in ten-gallon tins and barrels, then served in paper cups and plates.

ers—Dri-Gas Co., Hicksgas Inc., Kay Gases Co., Phillips Petroleum Co. and Skelly Oil Co.—took part in the demonstration.

Defense officials from Chicago and Illinois and John J. Hurley, national director, mass care division of the Civil Defense Administration, Battle Creek, Mich., visited each of the feeding sites.

The Chicago area L. P. gas committee which participated in the exercise is one of many groups formed by the Liquefied Petroleum Gas Association in "critical target areas" to place the industry's know-how and facilities at the disposal of civil defense authorities. Mark Anton, president, Suburban Propane Gas Corp., Whippany, N. J., is chairman of the national committee directing the activity.

The National Council for L.P. Gas Promotion and Gas Appliance Manufacturers Association cooperated in the Chicago test.



Girl Scout Leader, Mrs. Jack Griffin, serves John J. Hurley, director, mass care division, Civil Defense Administration, Battle Creek, Mich. Girl Scouts tended "operation hamburger" at the mass feeding exercises.

Civil Defense Worker Joe Sabatini serves Mrs. Richard Lord and her five children hot beef stew at Nov. 6 emergency feeding exercise.



NEW CHEVROLET TRUCKS

**keep going longer,
keep going for less!**

From the day you first put it on the job until the time comes to trade, your Chevrolet truck's going to do more work for you while you spend less to keep it going. Here's why you can count on it—

INCREASED POWER SAVES YOU PLENTY

Chevrolet's high compression ratio (in each of its three great engines) develops more power. That means you go longer before filling the tank! It means, too, you've got extra power handy whenever you need it—for greater acceleration, for an easier pull up steep grades, for steadier going through mud and sand on off-the-road jobs. So, you save not only on operating costs—you save *time* as well.

GREATER RUGGEDNESS PAYS OFF IN LONGER LIFE

Two-ton models, for example, are equipped with heavier axle shafts. All models have newly designed clutches and stronger frames. The best part of it is that, throughout their longer life, you spend less for their upkeep. For complete details about the model you need, see your Chevrolet dealer. He'll tell you whatever you want to know, then give you the best news of all: Chevrolet trucks are priced lower than all other lines! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

**MOST TRUSTWORTHY TRUCKS
ON ANY JOB!**



CHEVROLET ADVANCE-DESIGN

TRUCK FEATURES

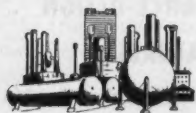
THREE GREAT ENGINES—The new "Jobmaster 261" engine* for extra heavy hauling. The "Thriftmaster 235" or "Loadmaster 235" for light-, medium- and heavy-duty hauling. **NEW TRUCK HYDRA-MATIC TRANSMISSION***—offered on ½-, ¾- and 1-ton models. Heavy-Duty **SYNCHRO-MESH TRANSMISSION**—for fast, smooth shifting. **DIAPHRAGM SPRING CLUTCH**—improved-action engagement. **HYPOID REAR AXLE**—for longer life on all models. **TORQUE-ACTION BRAKES**—on all wheels on light- and medium-duty models. **TWIN-ACTION REAR WHEEL BRAKES**—on heavy-duty models. **DUAL-SHOE PARKING BRAKE**—greater holding ability on heavy-duty models. **NEW RIDE CONTROL SEAT***—eliminates back-rubbing. **NEW, LARGER UNIT-DESIGNED PICKUP AND PLATFORM STAKE BODIES**—give increased load space. **COMFORTMASTER CAB**—offers greater comfort, convenience and safety. **PANORAMIC WINDSHIELD**—for increased driver vision. **WIDE-BASE WHEELS**—for increased tire mileage. **BALL-GEAR STEERING**—easier, safer handling. **ADVANCE-DESIGN STYLING**—rugged, handsome appearance.

*Optional at extra cost. Ride Control Seat is available on all cabs of 1½- and 2-ton models, standard cabs only in other models. "Jobmaster 261" engine available on 2-ton models, truck Hydra-Matic transmission on ½-, ¾- and 1-ton models.



Time Is Running Out

... but a quick survey of your operation may still save you from the many headaches brought on by winter. It was with this thought in mind that Standard Oil Co. of California compiled the following check list and suggestions.



Plant Equipment

1. Blow down, disassemble and thoroughly clean pipeline and meter strainers. A clogged strainer reduces pump efficiency and steals precious time.

2. Repair or replace badly worn or otherwise inefficient liquid pumps, thereby reducing pump operation time to a minimum. (1 and 2 apply to tank trucks as well as plants.)

3. Check operating condition of vapor compressors and blow down oil traps where installed. Change crankcase oil and maintain at proper level. Tank cars must be unloaded and released in the shortest possible time.

4. Replace old, worn or deteriorated tank car unloading and tank truck loading hoses. The product lost through a ruptured hose may be just what is needed to prevent a good customer from being out of fuel.

5. Be sure you have an adequate supply of methyl alcohol and a suitable means of injecting it into bulk storage or consumer systems if and when it is required.

6. Check operating condition of stop and waste valves in the plant water system and provide adequate frost protection for water pipes and faucets which must remain in constant service. Get them wrapped.

7. Where they exist, keep building eaves, troughs, and down spouts free of leaves and other debris, and otherwise provide for adequate run off of rain and melting snow water.

8. Provide the necessary tools for removal of snow and

ice and a supply of rock salt for use on tank car unloading towers and pathways to minimize the personal hazards in connection with icy surfaces.

9. Check plant electrical system for burned out light bulbs, faulty switches and loose terminal connections. Provide adequate supply of spare fuses.

10. Remove discharge stacks from plant storage relief valves, clean out deposits of pipe scale, dirt, dead insects, etc., and be sure water drain opening is unobstructed. The freezing of accumulated moisture in the relief valve can cause costly damage and might render the valve inoperative.

11. Install small tin cans or other suitable loose fitting rain caps on all exposed hydrostatic relief valves in plant pipe lines. Where such valves are installed in pump houses or other buildings be sure the discharge is piped through the roof and rain caps installed.



General Marketing Practices

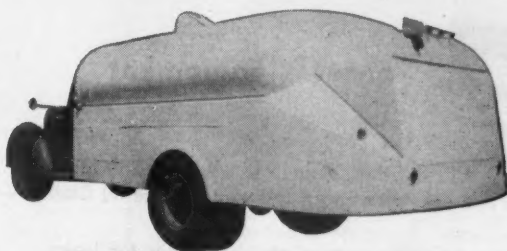
1. Consistent with weather conditions, try to program your deliveries and anticipate your requirements in an effort to place your tank car orders with the thought of keeping your plant storage filled. In this manner only can you protect yourselves against the possible and often unavoidable delays in tank car arrivals.

2. Give special attention to the matter of accounts receivable. You will need every available dollar to meet

You Can Depend on the BAGWELL LINE!



**Truck
or**

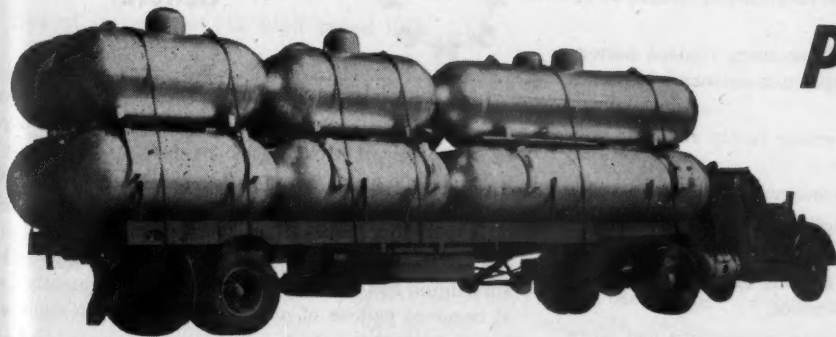


*1300 to 1700 W. G. Full Streamlined
Twin-Barrel*

**Domestic
Tanks**



**... for more
PROFITS**



Domestic Tanks for Pick-up, Trailerload or Carload

Write for Further Information and Prices

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P. O. Box 391

SAPULPA, OKLAHOMA

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Tulsa 50-8500**

the abnormal demand for working capital during the peak months.

3. Check and service all possible space heating installations in the interest of increasing satisfaction and reducing the number of emergency service calls.

4. Make sure that major space heating appliances are provided with an adequate supply of fresh air to support combustion and to permit satisfactory venting.



Motor Equipment

1. Before cold weather, change to winter grade lubricating oil and gear case lubricants and replace oil filter elements.

2. Flush out cooling system, check radiator for leaks, replace doubtful radiator and heater hoses, check water thermostats. Where used, replace low temperature thermostats with units rated at 175° or 180° and add permanent type anti-freeze well in advance of that first cold night. Be sure to tag the radiator cap and date it.

3. Fuel systems.

(a) On propane-fueled trucks, clean fuel filters, replace old fuel lines if signs of deterioration are noted. Overhaul or replace vaporizer units and check all adjustments for maximum efficiency and easy starting.

(b) On gasoline-fueled trucks, clean fuel filters, replace old fuel pumps and check carburetor adjustments.

(c) All trucks, clean or replace air cleaner elements.

4. Ignition and electrical systems. Cold weather operation places an extra burden on the entire ignition and electrical system. To assure quick starting and trouble-free service:

(a) Recharge or replace weak or aged storage batteries. Any which have gone through two winters should be replaced.

(b) Clean terminals and if necessary replace battery cables and ground straps. Apply non-corrosive lubricant to terminals.

(c) Test and if necessary replace faulty coils and condensers.

(d) Adjust or replace distributor points.

(e) Check insulation on high tension wiring. Replace if hardened, cracked, or oil soaked.

(f) Clean and adjust point spacing of spark plugs. Replace if in service over 10,000 miles.

(g) Check all wiring for loose connections and worn insulation.

(h) Check generator. Replace worn brushes and be sure charging rate is adequate to meet abnormal winter demands on the battery.

(i) If starting motor is sluggish with fully charged battery, check condition of brushes and bearings, also starting switch contacts and battery cable connection.

(j) Check all lights, replace dim or burned out bulbs and faulty reflectors and lenses. Check headlights for proper alignment.

5. Check windshield wiper power units. Replace

cracked or oil soaked vacuum tubes and faulty wiper blades.

6. Replace cracked or blurred windshield and cab door glasses.

7. Braking system. Effective brakes are always important, but they become doubly so in the face of the extra hazards involved in winter driving.

(a) Check linings and drums for excessive wear, grease and dirt. Re-line and true drums if necessary.

(b) Check hydraulic system, master cylinder, pressure distributing system and brake cylinders, replace parts as required, check fluid level. Adjust for equal application and ample pedal clearance.

(c) Check and adjust emergency brake linkage for positive action. Lubricate holding ratchet and replace worn parts that might cause it to disengage.

8. Tires.

(a) Repair or replace tubes with slow leaks. Install new valve cores.

(b) Replace or retread smooth or otherwise defective casings.

(c) Be sure both tires on dual wheels have approximately equal tread thickness.

(d) Be sure all rear tires on each truck have approximately equal traction qualities.

(e) Check frequently for proper inflation. Underinflation contributes to rapid wear and carcass injury. Overinflation reduces traction.

9. Provide each truck with a set of tire chains in good condition and insist that drivers use them when snow, ice or mud conditions indicate their need.

10. Other items of special winter equipment recommended for each truck include a shovel, a tow chain and a sack or box of dry sand.



General

1. Before unloading, check all tank cars for free water by opening the tank car sampling valve. A small deposit of free water, if it exists, can be drawn off through this valve. If free water is found, it is evident that the product is saturated with water in suspension and methyl alcohol should be introduced to counteract it.

2. After unloading, check tank car sampling valve to be sure liquid has all been removed. Quite frequently several hundred gallons of product is returned in supposedly empty tank cars.

3. Matters pertaining to the problems and hazards of winter operation should be discussed with all members of your organization, and each man should assume the personal responsibility of contributing his utmost toward maximum efficiency and safety and minimum hardship and loss of time.

4. In particular, a driver who is young both in age and experience should be carefully instructed in the principles of safe driving under winter conditions, and made to realize that the life he saves through safe practices may be his own.

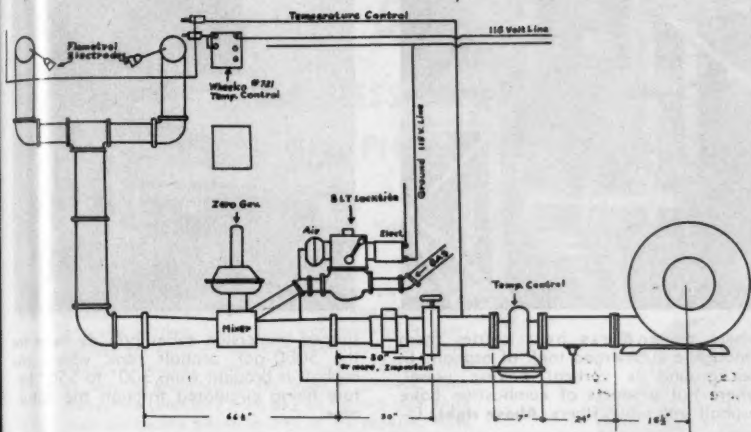
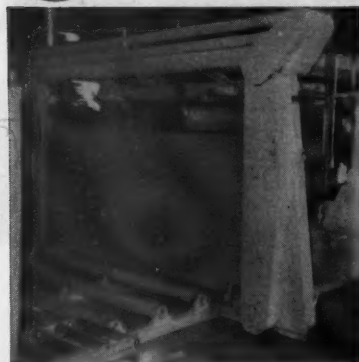


Fig. 1.



Stacks of 4 x 8 sheets of pressed wood are moved onto the production line from the automatic feeder. A hydraulic system picks up a sheet at a time and passes it into the shiplapper and cutting machine.

Propane Aids Capacity

Production of Siding Sections

By William W. Clark
Editorial Director

Heat is a critical factor in the manufacture of siding sections at this Oregon plant, where the shingles must be of such uniformly high quality that they will effectively simulate raked shakes, brick, and stone. The qualities of propane that make it susceptible to close control are utilized at several stations on the high-speed line.

THE close control that is possible with LPG for industrial utilization has been put to good use on a new production line for Western Insulated Products Inc. of St. Helens, Ore., to enable the company to turn out insulated siding sections at a high-capacity rate.

Propane plays a vital role in several heat applications along the new line, which operates completely automatically from raw materials to end-product. Better quality control and an improved product are achieved in the installation. Safety in fuel usage has also been achieved to the ultimate degree, thanks to a carefully engineered system installed in cooperation with the fuel suppliers, the

Multnomah Fuel Co. of Portland, Ore.

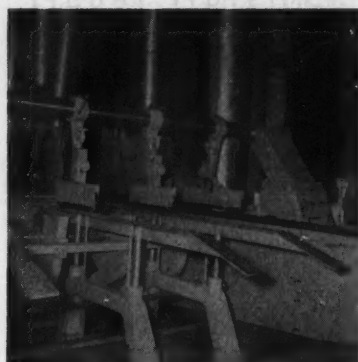
Western Insulated Products manufactures various patterns of asphalt-impregnated shingles, which are gaining in popularity for use as siding, as well as high-grade roofing sheets. Slate chips in variegated colors impressed into the shingles, are molded into patterns that simulate rake shakes, brick and stone. The feedstock used for the product consists of 4 by 8-ft sheets of pressed wood, manufactured at the neighboring plant of Firtex, parent company of Western. The siding units are cut in two sizes, 10 1/2 in. by 4 ft and 15 1/2 in. by 4 ft.

Although Western's old produc-

tion line utilized propane also, the new installation is more completely automatic, gives better asphalt impregnation through the use of a "baker," and permits a better pattern of colors to be laid on the sheets.

Impressive Load

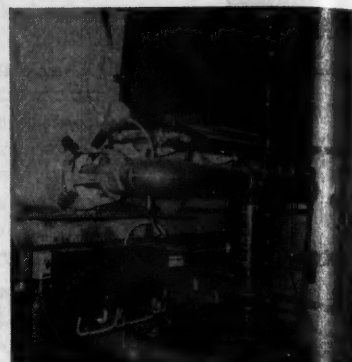
For Multnomah Fuel, this is a steady and impressive load. Western has its own 18,000-gal. tank. The saturator and baker alone consume up to 4 1/2 million Btu per hour. Heating of the pattern knives, booster heating for the asphalt storage, and warming of the slate to the proper temperature to prevent sudden cooling of the asphalt coating during pattern applica-



Above left: From the feeder the sheets pass through this machine, which both shiplaps the edges and cuts them to the proper dimensions. **Above center:** The shingles move to the saturator (center)



where an endless belt carries them through a submerged tank of asphalt. In background is vertical baking vessel, where hot products of combustion bake asphalt into wood fibers. **Above right:** U-



shaped immersion tubes provide heat for the 5000-gal. asphalt tank where the asphalt is brought from 300° to 550° before being circulated through the saturator.

tion increase this fuel use substantially.

Elaborate safety devices eliminate hazards in the asphalt heating tank, where asphalt brought in at 300° is heated to 550°. McKee-Eclipse Locktite safety valves, Wheelco Flame-trols, and temperature control valve work to automatically cut out the fuel in an emergency.

The 5000-gal. asphalt heating tank is heated with two U-shaped immersion tubes, each having a length of 42 ft. The first 4 ft of the tubes, in which the firing takes place, are of 12-in. diameter lined with high heat-resisting formed tile, which prevents coking and consequent burning out of tubes. The remaining length is reduced to 10-in. diameter. The gas is brought through the Locktite safety valve (Fig. 1) into the zero governor

at 8 in. pressure, where it is reduced to a pressure just below atmospheric before entering the venturi in the mixer.

From Mixer to Burners

A volume of air up to 1000 fpm is introduced into the mixer, passing first through the temperature control valve at 26 in. wc. From the mixer, the gas-air mixture passes to the two immersion burners, where Flametrol electrodes monitor the flame operation.

Flame failure actuates the Flame-trols, which control a solenoid valve to shut off the gas ahead of the Locktite valve (not shown in drawing). A failure in the air supply cuts the pressure on one side of the Locktite and closes the valve. A failure in the

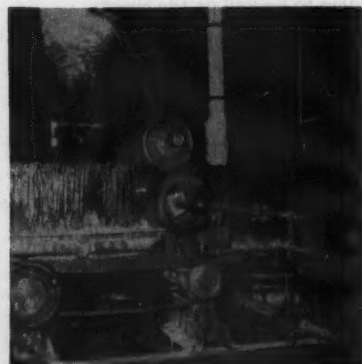
electrical circuit closes the Locktite valve from the outer side and shuts off the gas supply.

To start up the system after a failure, pilots are relighted and the Locktite reset manually.

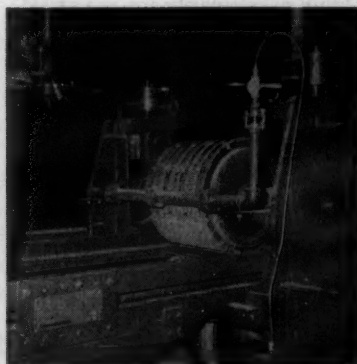
Temperature is controlled through a mercury-filled capillary tube leading to the temperature control valve, which automatically adjusts the air supply.

The production line begins with an automatic feeder, which, through a hydraulic system, passes the 4 by 8-ft sheets into a shiplapper, where two sides are notched, and into a cutter, where the sheets are divided into units of the desired size. The boards are then fed into a saturator, a deep tank with a semi-cylindrical bottom, where they are bathed in the asphalt. The saturator is filled with the hot as-

Below left: After cooling, shingles receive a surface coating of asphalt to hold the subsequent coating of limestone. Coating temperature is maintained by a manually set gas burner to give the right consis-



teness. Limestone chips feed through a hopper at right. **Below center:** Patterns are cut into limestone with rollers which are heated with LPG to a temperature that will give a clean pattern and prevent



adherence of the pulverized slate to the surface of the roller. **Below right:** Trimming knives, which square off the edges of the finished shingles, must also be heated to the proper temperature.



AMERICAN *Better Bilt* DELIVERY TRUCKS

LARGER PAY LOADS... LESS OPERATING COSTS... Mean Greater Profits for You!

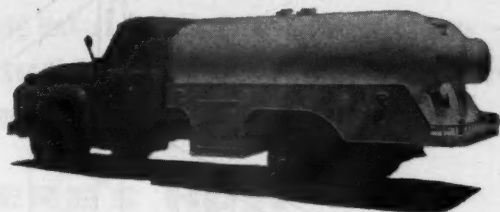
American engineered, perfectly balanced delivery truck units bring you — Lighter Weights — Easier Handling — More Gas Delivery — Safer Equipment.

★ **B31**—A very popular model with meter and storage boxes mounted on each side of truck and streamlined into the skirting. Motor fuel tank mounted in rear. Fittings are enclosed under a streamlined rear dome. Meter, if desired, is mounted in box on driver's side or may be mounted at the front of catwalk. Main valves are controlled from box on driver's side. Hose may be carried either in box or on catwalk. Hose reels may be mounted on all models if desired.

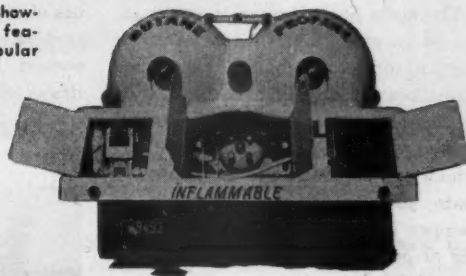
★ **B21**—America's most popular 1954 safety designed delivery truck. Motor fuel tank in rear. Meter may be installed in rear protected by small canopy or may be enclosed without destroying usefulness of design. Clutch and power take off controls are in rear. Two storage boxes are located in the rear and there is plenty of room for the hose. This unit was designed especially for safety of the driver and has been proven in service.

★ **N17**—A completely enclosed extra light weight compact unit designed with all controls, motor fuel tank, meter, hose reel, power take off and clutch controls all incorporated in rear streamlined cabinet maintaining perfect balance and symmetry of line. Rotary gauges are 1" in size, well protected.

★ **S83 Model** — The American single-barrel delivery unit in sizes from 1200 to 1600 water gallons incorporates all the many desirable features of the twin barrel trucks, including two storage compartments mounted on the rear, motor fuel tank on the off driver's side, plenty of room for hose and meter, and controls may be mounted in the rear if desired.



Rear view of N17 showing the desirable features of this popular model.



Delivery trucks made in sizes from 1250 to 2000 W.G.

ALL MAKES OF NEW TRUCK CHASSIS AVAILABLE AT LOWEST PRICES

American Tank & Mfg. Co.

PHONE Riverside 9183
P.O. BOX 5525



FINANCING AVAILABLE
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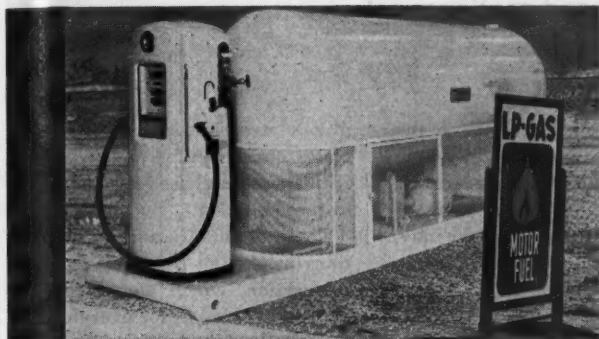
BUTANE-PROPANE News

Tap these EXTRA GALLONAGE MARKETS for new customers... new profits



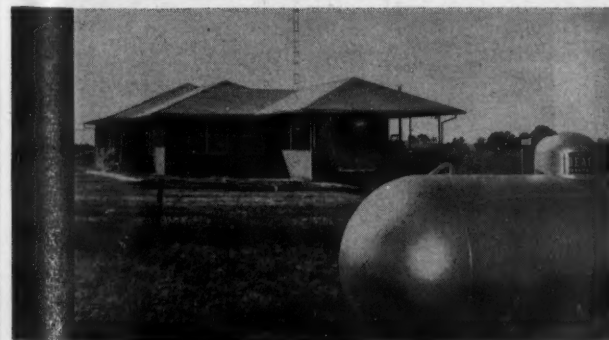
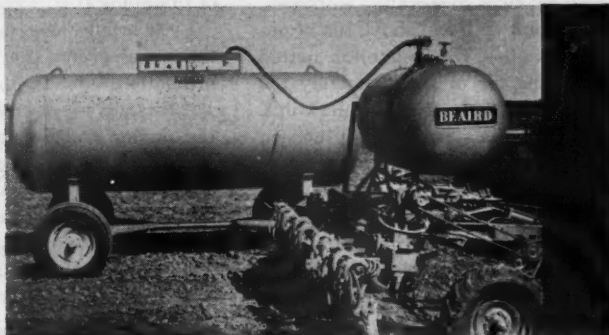
Looking for a new source of income...or a profitable companion line for your present business? Then take a long look at Beaird's Extra Gallonage Builders — Packaged LP-Gas Filling Stations and Anhydrous Ammonia storage and handling equipment.

HERE'S HOW -



THE 498,000,000-GALLON LP-GAS ENGINE FUEL MARKET is growing daily. (33% increase over last year) Fleets of LP-Gas fueled trucks and other vehicles are rolling down the highway . . . more and more LP-Gas fueled tractors are being used on the farm . . . city buses and taxicab fleets are converting to this new fuel . . . *and you can sell 'em.* Your Beaird packaged LP-Gas filling station comes to you ready to go to work immediately, storing and dispensing LP-Gas fuels. Your customers will like it too . . . for fast, efficient service.

THE \$440,000,000 NITROGEN AND ANHYDROUS AMMONIA FERTILIZER MARKET, right in your own back yard, is one of the fastest growing businesses in the country . . . and you have the pressure storage experience to share in the profits from the sale of this miracle fertilizer. Beaird offers you a complete line of storage equipment—applicator tanks, truck and trailer mounted field supply tanks, farm and dealer storage vessels, trailer transports and complete packaged "turn-key" dealer installations designed to put you in this profitable business—*economically!*



THE 2,500,000,000-GALLON LP-GAS HOME MARKET has been built on satisfied customers. That's why you'll want to join the hundreds of dealers who are switching to Beaird LP-Gas systems. Your customers are better satisfied and easier to sell, when you offer them the only nationally advertised and distributed LP-Gas system—the only LP-Gas system that carries the Good Housekeeping Seal.

Get full information on Beaird products designed for these extra gallonage markets — write today.

 PACKAGED COMPRESSOR PLANTS	 CAST STEEL FITTINGS	 PRESSURE BULK STORAGE	BEAIRD
 ANHYDROUS AMMONIA EQUIPMENT	 LP-GAS SYSTEMS	MACHINING FABRICATING STEEL WAREHOUSE	

SPECIAL NOTICE — for immediate delivery Beaird "Pay-liner" trailer transports:

For Anhydrous Ammonia — 6165 W.G. Capacity single barrel design 100% X-rayed and stress relieved and 5380 W.G. Capacity twin barrel design 100% X-rayed.

For Propane — 6000 W.G. and 5400 W.G. Capacity twin barrel design 100% X-rayed.

THE J. B. BEAIRD COMPANY, INC., SHREVEPORT, LOUISIANA
STOCKTON, CALIFORNIA

Prescription For Selling

A special events package, close cooperation between salesman and dealer, and good promotion boosts prospect lists and appliance sales.

WOULD you trade 400 orchids (at 17½ cents apiece) for a three-day sales boom resulting in signed orders for six water heaters, seven deluxe ranges, one freezer, and a 500-gal. heavy duty system?

That, essentially, is what one enterprising dealer recently did with the aid of a Skelgas promotional package and a group of cooperative employees. And, along with the above list of on-the-spot sales, the promotion netted a working file of approximately 150 valuable leads for future follow-ups. This is no isolated, specially chosen case, but is typical of "selling parties" that aggressive dealers are using every day to boost sales and spread good will throughout the community.

The number of subjects or themes for such promotions is unlimited; the

vital factor is that they have the necessary public appeal to get people into the store. Skelgas features such special events packages as anniversary day, cookie day, pancake day, and ham-and-bean day. Using these and countless other ideas, the store owner can capitalize on the housewife's love for parties and have a lot of fun doing it.

Let's briefly look into the behind-the-scenes events that led up to this promotion:

A Skelgas representative called on the dealer and suggested a selling party in order to stimulate sales. The dealer, after discussing the types of promotions, decided to purchase the appreciation day package. This particular kit consists of displays, decorations, give-aways, and invitations,

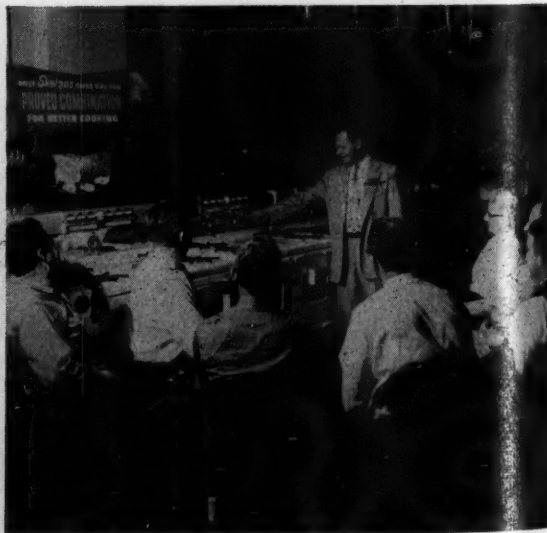
plus a mealtime kit which includes plates, cups, napkins, and spoons. All of this was purchased at nominal cost to the dealer.

The individually addressed invitations asked the persons to join the celebration, which would feature ham and pancakes for everyone, and orchids for the ladies. This would serve as a powerful instrument in filling the dealer's store with prospects for ranges, water heaters, washers, and dryers during the event.

Once the date had been established all of the employees made a special effort to invite every customer to attend. This continued right up to and including promotion day. The dealer received the invitations already printed with his name and address and more than 2000 were sent out.



The salesman (left) and the dealer talk over the appreciation day program well in advance. Ironing out problems and planning schedules are essential "musts."



A sales meeting, conducted the day previous to the opening by the Skelgas representative, helped salesmen brush up on fresh selling pointers.

This winter be sure...

Buy your LP-Gas from Pure!

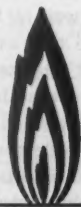
No matter how low the thermometer goes this winter, you can be sure your LP-Gas won't freeze up if it's PUREGAS.

PUREGAS, you see, is the sure LP-Gas... always moisture free... always exceeds NGAA specifications... always of a uniform quality.

And you can be sure of prompt, dependable delivery... no matter what the weather... because Pure Oil maintains its own fleet of tank cars that travel in any weather, any time of the year.

So decide to be sure from now on... especially this winter. Call or write your nearest Pure Oil office.

- **UNIFORM QUALITY**
- **FREE FROM MOISTURE**
(PREVENTS FREEZE-UPS)
- **PROMPT SHIPMENTS**
(IN ANY WEATHER)
- **EXCEEDS NGAA SPECIFICATIONS**
- **DEPENDABLE PRODUCTION**



Puregas

Be sure with Pure



The Pure Oil Company, 35 East Wacker Drive, Chicago 1, Illinois... Tampa, Florida, Box 1630... Lubbock, Texas... Houston, Texas, Box 239... Worland, Wyoming, Box 38... Minneapolis, Minnesota, 1306 South First Street.



Flapjacks just like Mom used to make are being served by this helper. Ham,

The Skelgas representative explained that the attraction of a free orchid would be a big customer inducement. The corsages, consisting of three Hawaiian button orchids, were to be flown air express from Los Angeles. "Orchid" is a magic word to women, and yet these exotic flowers cost the dealer only 17½ cents apiece.

To whet public curiosity, some of the decorations were put up a week before the event, and ads were run in the local newspaper. The dealer called a meeting of his entire staff to

that people would have to sign in and then pass his ranges (being used for cooking) before getting the food. This also gave his salesmen a better chance to interest people in the various prices of the appliances being offered.

Finally, the store was cleaned up, merchandise was inspected and polished one last time, and decorations from the special package were put up.

On the morning of the first day they started coming in . . . the lookers, the listeners, and the prospects.



Registration was an important part of the program. The dealer later used this list for prospects, some of which developed into sales.



Orchids were given every woman who attended the celebration. In this case so many people attended that the orchids ran short, and gardenias were substituted.

assign various duties. He assigned someone to wash dishes and make coffee, and another to be griddleman. One man was to broil and cut the ham, while two women were to pin on orchids and handle registration. He made sure he had plenty of help with the serving so that his salesmen were free to demonstrate and sell.

The night before the event a short sales meeting was held to suggest new selling tips, and the staff brushed up on any points on which they might be questioned.

The dealer also realized that the store arrangement was important. The flowers and registration cards were at the door, with the ranges and food tables at the rear of the store. Appliances to be demonstrated were on both sides of the aisle that led to the rear. In this way the dealer knew

Registered, given orchids, and made to feel at home, they were served food and sold appliances. More than 1000 people attended the three day affair, and 492 families registered. Over 400 corsages were given away (women wearing them out of the store were good walking advertisements).

You know the results. The salesmen, free to build interest, sold 14 appliances. Sixteen couples were converted to Skelgas. Prospects for future follow-ups included 46 people interested in the deluxe gas range, 30 who wanted freezers, 26 new water heater sales, 16 who expressed an interest in buying a dryer, and 13 new home heating possibilities.

Adapted from the April, 1954, issue of The Skelgaser, published by Skelgas Division, Skelly Oil Co., Kansas City, Mo.



Well fed visitors are ready to talk about gas ranges, water heaters, and clothes dryers.



Under Control - all the way...

When you contract for Shell Propane, it's *Shell-controlled* every minute from source of production to tank car or transport.

Shell has long maintained the policy to sell propane only within the company's capacity to produce and deliver. This assures contract customers a continuous supply of Shell Propane.



SHELL OIL COMPANY

ALBANY • ATLANTA • BALTIMORE • BOSTON • CHICAGO • CLEVELAND • DETROIT
INDIANAPOLIS • LOS ANGELES • MINNEAPOLIS • NEW ORLEANS • NEW YORK
PORTLAND, OREGON • SACRAMENTO • ST. LOUIS • SAN FRANCISCO • SEATTLE

DECEMBER, 1954

Safety Will Always Be Everybody's Business

By Carl Abell
Editor

THE safety meeting program outlined on this page is the last of the series which has been appearing in this magazine every month for almost two years. That does not mean that the holding of regular safety meetings as a feature of your plant operation should be allowed to stop.

In the L. P. gas industry, SAFETY IS EVERYBODY'S BUSINESS, not for any given period, but all the time. The purpose of any safety program is the prevention of accidents. Most accidents occur because of human failure—somebody did not know, or somebody forgot, or somebody was careless.

It is human to forget. It is human to become so accustomed to hazards that we are no longer conscious of their existence. It is human to relax vigilance because "it hasn't happened

yet." It is the business of management to see that humans do not give way to the great number of human weaknesses.

We said in the introduction to this series that accidents are preventable, and that the operations in connection with the L. P. gas business can be kept safe if management seriously wants them to be safe. But it is a job that goes on and on—it has no end. New employees must be trained in safety practices, and old employees must be reminded to continue to do their work safely.

The question arises as to how the ensuing safety meetings should be programmed. At least a suggestion of the answer is contained in the above paragraphs. Since people forget, it becomes necessary to refresh their memories. While old employees

are being reminded, new employees can be trained.

In the months since your organization went through the safety meetings in the series, your employees have had a great deal more experience. Experience has been a vital part of all these safety meetings. You can now go back over the same ground and make each meeting more valuable to your staff than it was in the original presentation. Your own employees will make it more valuable.

On the second round, you will not need to take the subjects in the order in which they appeared in the magazine. There are certain subjects that are of more importance than others in your operation. There may be certain subjects in the series which cover phases that do not concern your operation at all. Be selective; reschedule the meeting programs to cover the ground which specifically applies to your operation.

The general plan of programming for each meeting has proved sound. We suggest that you continue along the same lines, making it the responsibility of the safety committee to plan the program in advance, conduct the meetings, and supervise safety practices and projects. Safety is everybody's business, so everybody should be in the picture.

Suggested Program for Safety Meeting

1—Attendance record. Note absences.

2—Unfinished business. Are there any loose ends in connection with previously suggested improvements of safety equipment or practices?

3—New business. This is the end of the series of safety articles in the BUTANE-PROPANE News Safety Series. Everyone should be thinking of and suggesting special treatment of any additional subjects which should be covered in your plant's operation.

4—Discussion of "Safety in Service Station Installations."

DISCUSSION GUIDE

Safety in Service Station Installations

Let's begin with the greatest single problem in safe operation of service station facilities: the man who puts

the gas into the vehicle tank. What does he need to know? How is he going to get this information? How can his supervisor know that he is following the rules, including the one against overfilling the customer's tank?

If the service station is operated in connection with your own distributing plant, the problem is fairly simple. He has the company's safety program for training, and the knowledge of other employees for guidance.

In the operation of public service stations, turnover of help is a greater problem, and the qualifications of employees are frequently not so good. More men must be trained, supervision is more difficult, and the backlog of experience in handling LPG safely is seldom available.

Possible means of training and instruction are: hold meetings for the service station employees; provide them with written instructions; post

rules at the pumps; call on the industrial accident officials for help.

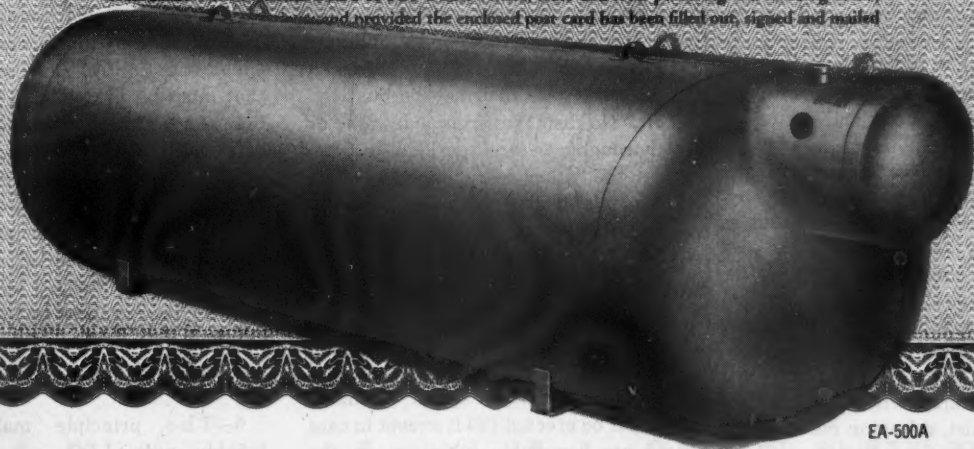
Can you develop a program using the above or other suggestions which will provide a practical solution in your locality? How can you make it effective? What information should it include? How can it be applied so the new service station employee knows what he is doing before he starts to work at the pump?

Every employee delivering gas to service stations should know the fundamentals of safety in connection with both equipment and operation. Before refilling the service station tank he should take a quick look to see that it will be safe to make the fill. From their knowledge of the station tanks which they fill the employees involved will know what they should check. Wouldn't it be a good idea to make a written check list for their own guidance? What subjects should be included?

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Texas Suffers From Drouth Headaches

The severe drouth in Texas has created many problems for the LPG industry there, among them leaks in piping systems. Pertinent thoughts on this problem were discussed in an article in *Texas Butane News*, published by Texas Butane Dealers Association, and reprinted in part below.

MOST sections of the state have been and still are gripped by drouth. This condition has brought a new headache for the butane industry because in many areas the ground is cracking open in every direction. This distortion of the soil is throwing strains on our underground piping and causing leaks where none existed before.

Due to the same conditions old leaks that never amounted to anything are becoming dangerous as gas may seep into a crack and travel a considerable distance before accumulating in an unexpected place. A number of accidents from such causes have taken place lately.

In an area where such conditions exist, a butane man will be wise to pay close attention to the customer's fuel consumption and, if a check reveals a larger than normal use of gas, find out why. A few minutes spent in making an opening check and running a pressure test on the lines might pay large dividends in a safer operation. Customers as a whole will appreciate the dealer's interest in checking their systems.

We are particularly vulnerable in areas where we have underground systems that have been in the ground for a long time.

In case a leak is discovered, check all wells, cisterns, storm cellars and other low places to be sure gas has not settled in them.

It has been suggested by some dealers and safety experts that each system be checked at least twice a year as a means of preventing accidents. The idea certainly has merit. Such checks would also give us a fine chance to keep up with the new openings and appliances customers have installed themselves.

Answers to November Safety Questions

Questions for Safety Article No. 22, "Safety in Service Station Installations," appeared in the November issue on Page 64. Here are the answers.

1—That depends on the attitude of the enforcement officials. Pamphlet 58 and the codes say that the 2000-gal. tank may not be installed closer than 25 ft from "a building, groups of buildings, and adjoining property lines that may be built upon." No distances from sidewalks or thoroughfares are specified, but under the "other reasonable protective methods" clause of Section 7.5 (a) of Pamphlet 58 the local fire authorities could claim discretionary powers.

2—(a) Get approval of local authorities on equipment and place of installation. (b) Maintain the required distances from buildings and property lines on which buildings might be erected (25 ft except in case of non-flammable buildings on the service station lot), and from containers of flammable liquids (20 ft). (c) Provide foundations acceptable to the local authorities. (d) Install crash-posts or curbs as required to protect unit from collision. (e) Provide enough hose to service vehicles at required distances from storage tank—minimum 10 ft.

3—The area subject to traffic should be covered by a heavy concrete slab or other adequate protection. The well, manway or other means of installing the valves and fittings should be protected from traffic by suitable crash fences or raised concrete curbs.

4—Must be outside buildings, not less than 10 ft from a storage container, suitably removed from any pits, sumps, sewer inlets, or opening into or under buildings. Should also be away from dispensers for other fuels and where collision is unlikely.

5—Remote control may be accomplished by means of an electric circuit connecting a switch at the dis-

enser directly with the pump motor, or by a hydraulic remote control with the operating mechanism at the dispenser controlling a switch at the pump or some other location. The "dead man control" is a mechanism that must be held in the "on" position, but returns automatically to the "off" position when released. It may be spring, gravity, or electromagnetically (solenoid) loaded. For the purposes of this particular problem it may be located inside the dispenser housing, and connected by chain to the fuel hose so the man at the vehicle tank may turn the switch on by pulling the hose, and off by releasing it.

6—The principle maintenance trouble with LPG computers is caused by starting the pump before the meter is cleared from the previous transaction, and while it is still "locked." The high pressure in the line damages the gears in the computing mechanism. As presently built, the answer is to always clear the meter before starting the pump. Possibly you can figure out a means of interconnecting the computer clearing lever with the pump motor circuit so the pump cannot be started until the computer is cleared.

7—It should be protected from corrosion, physical damage due to overhead traffic, and the possible effects of heaving due to frost.

8—To prevent possible freezing of the operator's hand while disconnecting the hose.

9—To prevent loss of a customer by the worst possible way—through fire or explosion.

10—By providing ample means of ventilation through the floor of the trunk, and by fanning the trunk lid up and down.



Which range has the OVEN-REDDY?

(The signal that tells when the gas oven is at cooking temperature)

It's small wonder that more and more makers of gas ranges are adopting Wilcolator's Oven-Reddy. And on sales floors the country over, these ranges are stopping traffic, creating tremendous buyer interest as word gets around about Oven-Reddy.

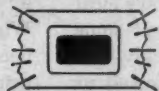
For here's a feature that makes any range stand out from the rest. It really gives your salesman something to talk about to today's smart buyer—something she can see means better cooking and really saves her time. It's something she's always wanted—and never before could get on a gas range.

You will find Oven-Reddy today on many of the leading gas ranges—and there are other manufacturers planning to use it on their new models. A little prodding from you might help your manufacturer decide now, and give a big boost to your sales. The Wilcolator Company, 1001 Newark Ave., Elizabeth, N. J. Canadian Plant: Mimico, Toronto, Ont.

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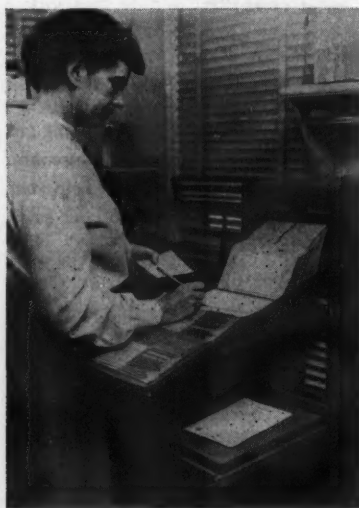
Wilcolator
OVEN-REDDY

Business Booming? Time to Check Record Systems

By Dean A. Kearsch

NOT so many years ago, the L. P. gas dealer who was serving 1000 accounts was enviously considered by other dealers as a real Big Time Operator. But the status of our industry has grown so rapidly that the thousand-account dealer today is looked upon as an ordinary Joe who has finally climbed out of the small potato class.

One thousand accounts, nevertheless, is a milestone for any dealer. It is, at least, the critical moment when his office methods and record-keeping techniques should be examined and evaluated. No longer is it possible to



Customer history and consumption records are kept in fire-resistant cabinets. Clerk is posting drivers' reports on customers' records. Card in upper pocket is the trouble order.

keep memos on scraps of paper tucked into a corner of the desk blotter, nor will the back of an old envelope suffice for a checklist of slow payers.

No, with a thousand accounts a good office system is really necessary if the dealer wants to be in control of his business. While there are many good methods that may be applied, let us look at the practices of a Jacksonville, Fla., company that, at this writing, is just in the thousand-account class.

Edward F. Shore, president of Shore Gas Co., Jacksonville Beach, found his biggest problem—like so many other dealers—was getting the money in from the charge customers.

"With fewer accounts, I was always aware of who was slow," comments Mr. Shore. "The 'good' people who just forgot about little bills and needed a reminder were at my fingertips. But as the customer list grew, it became necessary to spend many hours every month thumbing over ledger pages to get this information. Unfortunately, when other duties prevented it, sometimes this wasn't done—and the delinquents just became more delinquent.

"We asked Remington Rand's local representative if there wasn't some easy way of finding out quickly who owed us money, and he showed us the answer. Now we have a Safe-Desk instead of a ledger, Kolect-A-Matic panels with every account on a visible line instead of pages that stick together, and Graph-A-Matic



Edward F. Shore (right), president of Shore Gas Co., scans ledger panels for delinquent accounts, obvious at a glance because of position of special signal.

signals that permit me to review the credit status of our thousand accounts in just about half an hour."

Shore is using what is known as SUIAP—the Simplified Unit Invoice Accounting Plan. Each customer has a ledger pocket instead of a page. "Posting" is done by dropping in a charge slip, or removing it when paid. Each time the ledger pocket is used, the sliding Graph-A-Matic signal on the visible edge is properly adjusted to show the month of last unpaid invoice. Thus at a single glance, the delinquent accounts stand out prominently by the variance in the signal position, and it is easy to know who should be followed up.

"Now we have complete executive control," states Mr. Shore. "We have been able considerably to reduce our outstanding receivables. It is an easy matter to review the accounts regularly.

Mr. Shore's ledger control is supplemented with a Kardex customer history record. Permanent cards in each pocket include an appliance record, meter record and consumption record. In the upper half of the pocket is a "Trouble Card" including directions for locating the customer. When a service call comes in, it is necessary only to check the proper printed spaces, remove the card and turn it over to the service man. After he has noted the work done, the card is returned to Kardex, thus providing a complete record of service required by each customer.



Anhydrous Ammonia

The farm markets of America are discovering a significant new crop aid — anhydrous ammonia. LPG dealers in scattered areas are discovering it, too; and they are asking themselves, "Is this a logical, profitable product for me to sell?"

Anhydrous ammonia is at once closely similar and vastly different from LPG in its physical properties and in its marketing problems. This special section of Butane-Propane News discusses these qualities, details capital requirements, explains application techniques, and passes along the sound advice of dealers who are experienced in selling and handling anhydrous ammonia.

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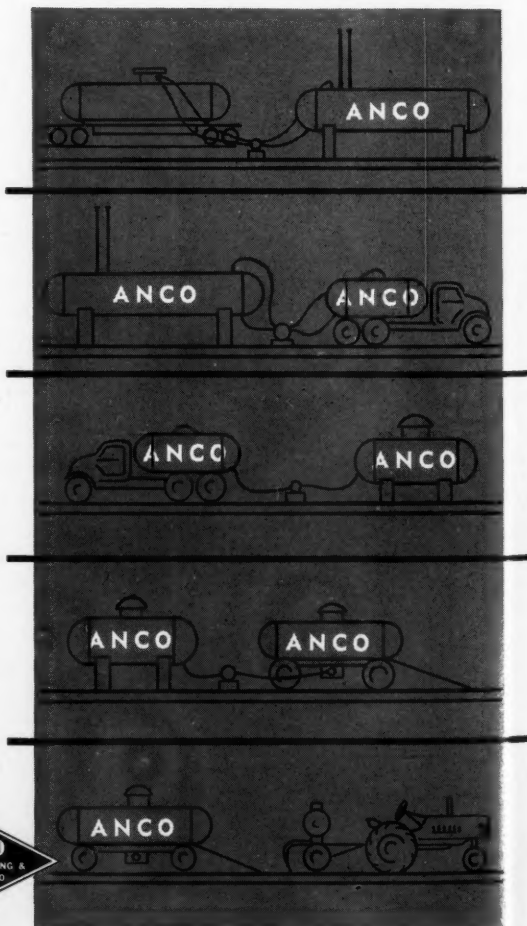
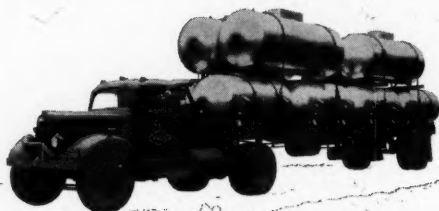
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ANHYDROUS AMMONIA— A New Opportunity For LPG Distributors

By Lynn C. Denny
Associate Editor

Is the handling and marketing of anhydrous ammonia a logical extension of a dealer's gas business, or is it a hazardous venture, fraught with economic and physical perils? Many facets of this activity must be considered in arriving at an an-

swer to this question; and herein Editor Denny undertakes to provide a broad introduction to the subject as a lead-in to the detailed articles on the various phases of the problem that follow in this special anhydrous ammonia section.

THERE is great, new agricultural development spreading across the United States. Like liquefied petroleum gas, it is of paramount interest to those in rural districts—particularly farmers.

The same farmers whose methods of work and manner of living have been revolutionized by the application of portable gas to power their engines, dry their crops, brood their poultry, cook their meals, heat their water, operate their refrigerators and air condition their homes, are now learning how to increase their crop yields and enhance the value of their land with another portable gas—this time, anhydrous ammonia.

While the virtue of ammonia as a fertilizer has been common knowledge for a long while, only the last few years have seen its wide application to a large variety of farm crops. It has been commercially available only since about 1947 and then in but limited quantities. Now, spurred by an almost clamorous demand of farmers over the nation, production has increased until this year it has reached a peak of an estimated 325,000 tons (see Table 1) which will be spread over as much as 9 million acres throughout the farm lands of

nearly every state in the union.

Production plants have been increasing their manufacturing facilities at a rapid rate but have been unable to supply the demand, and when a balance between production and sales can be attained is but a guess.

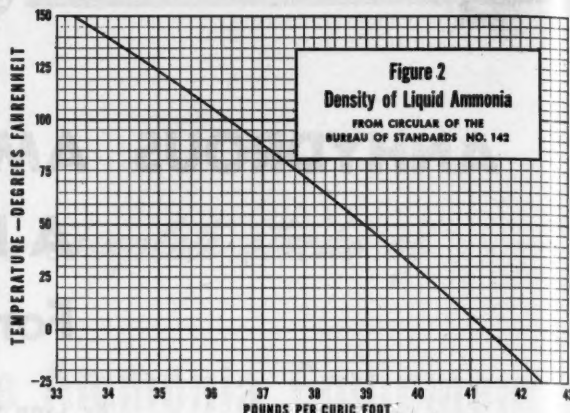
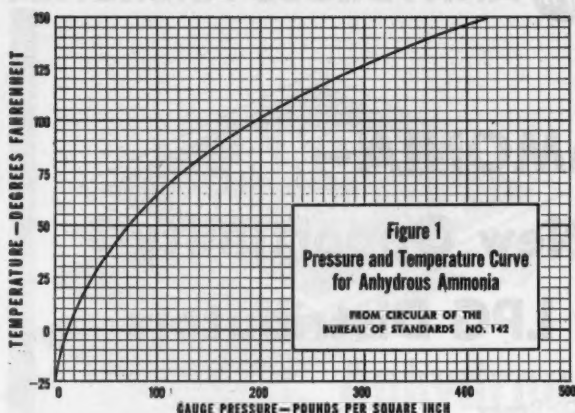
But anhydrous ammonia is not sold to the farmer by the producer. There is a very important middleman, and he is the one to whom this special section of BUTANE-PROPANE News is directed this month. We refer specifically to the liquefied petroleum gas distributor, often termed the most logical individual to effect liaison between the other two vital constituents in this triple alliance.

The LPG dealer has been termed a "natural" for two primary reasons: First, the clientele to which he has been serving L. P. gas is, in numerous instances, the very same to which anhydrous ammonia is sold. The dealers know these farmers personally, and there already exists between them a mutual understanding and confidence that makes it the most natural thing in the world for the dealer to extend his business dealings to AA.

Second, the dealer is familiar with a product (LPG) which is similar in its vapor pressure and method of storage and handling to AA. The vapor pressures of the two gases are

Table 1. Production of Anhydrous Ammonia

Year		Tons	Percent
1947-48.....	about	54,000	
1948-49.....		86,000	up 60
1949-50.....		106,000	up 23
1950-51.....		147,000	up 39
1951-52.....		208,000	up 42
1952-53.....		315,000 to 325,000	up 51



almost identical under the same temperature; both are transported and stored as liquids and utilized as gases. Storage tanks, transport units, delivery tank trucks, compressors and other equipment, except for fittings, are approximately the same for both products, and safety precautions so essential to follow for one are applicable in most respects to the other.

Unquestionably a dealer, well grounded in safe handling practices of LPG, will have less to learn and will be more cautious than one without such experience.

Yet, there are those whose experience does not permit them to accept this theory. Some claim that if a distributor handles both products, he should keep all departments of his operations entirely separate, and, further, that his acquaintance with the methods of dispensing LPG are of negligible benefit if he undertakes an AA campaign of selling and distribution.

Also it is true that equipment for

the two businesses is not interchangeable without complete purging and changing of valves and fittings because the copper and copper alloys much used in L. P. gas equipment will corrode when subjected to contact with AA.

Because the LPG distributor is trying to build up a large summer load to offset the winter space heating requirements, some think he can ill afford to switch his sales force to other efforts or divide selling time between both industries.

Get the Facts

In order to go beyond theoretical reasoning on so vital a point, BUTANE-PROPANE News recently questioned all LPG bulk plant operators upon this very subject. Details of many answers are tabulated elsewhere in this section, but briefly it was the majority opinion that L. P. gas distributors are in a more favorable position, generally speaking, than any other

middlemen to handle and sell AA. Reasons given for and against are sufficiently revealing to justify close scrutiny of representative replies as shown in letters received and in the tabulations.

Universally it is agreed by those with experience that a comparatively large capital investment is necessary to handle anhydrous ammonia on a profitable basis. The most important requirement is substantial bulk plant storage by the distributor. Economically, this should total not less than 30,000 gal. and may well reach twice that amount for an average size operation.

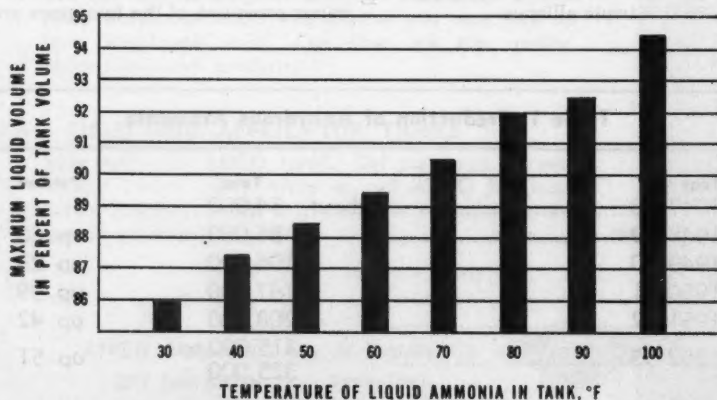
One reason for this is that distributors are required to accept regular monthly shipments of product irrespective of the fact that their dispensing seasons are limited principally to three months in the spring and a few weeks in the fall. This is due to the fact that producers cannot provide storage at points of manufacture, and so contracts provide for regular shipments 12 times per year.

In addition to bulk storage facilities, a distributor must provide his transportation units and invest in a large stock of consumer tanks, skid tanks, trailers, applicators, and other needed equipment. Approximate figures of capital outlay for a minimum operation are contained in Table 2.

How Large the Market

One should not attempt to equip for anhydrous ammonia operation, even if he has ample finances, until he has assured himself that he has a market of sufficient potential size to justify the investment, and until he has acquired a thorough knowledge of farming in general, and of fertilizer

Figure 3. Maximum Safe Volume of AA in Pressure Storage Tanks.



needs in his territory in particular. He must become somewhat of an authority on crop production, the chemical construction of various soils, and on the questions of when and how much nitrogen should be applied under varying conditions.

County and state agricultural agents are good sources of reliable information, as also are the farm schools of state universities. Many of these issue bulletins and pamphlets that are highly informative.

While ammonia is very rich in nitrogen, there are two other basic nutrients required for crop production: phosphorus and potash. If nitrogen runs low in the soil, crops suffer severely, as it forms the cells that make up stems, leaves and fruit.

High in Nitrogen

Because 82% of its weight is nitrogen, anhydrous ammonia contains the highest percentage of usable nitrogen per pound of any available fertilizer, and it is also the cheapest when figured on a basis of cost-per-pound of usable nitrogen.

Huge amounts of nitrogen are removed from the soil every year by most crops, and it has been replaced in the past by supplying solid forms of ammonia, by crop rotation, by spreading animal manures, or other methods. By using AA this needed nitrogen can be replaced yearly.

While owners of farms of less than 100 acres—and in some areas several

hundred acres—may find it hard to justify investment in storage tanks, applicators and other equipment for their own operations, it is possible many times for distributors to create business for themselves by contracting with farmers to apply the fertilizer for them. In such event, of course, the distributor must purchase as many operating units as he finds necessary to meet the demands which may be made upon him. This requires additional capital but also offers a chance for increased profits.

For men familiar with handling LPG, there is probably no better way to explain many of the characteristics of AA than by tables and graphs. Table 3 shows the properties of AA at various temperatures. Fig. 1 is a pressure and temperature curve, and Fig. 2 gives the density. Fig. 3 vividly portrays the maximum volume of liquid anhydrous ammonia that can be stored safely in storage tanks.

From the facts above, and particularly from the information contained on other pages of this section, it will be readily apparent that anhydrous ammonia is destined to be a great industry for those who manufacture it, for the distributor who stores and sells it, and for the ultimate consumer who applies it to his fields and reaps in return a greatly augmented production of crops.

BPN ANHYDROUS AMMONIA

Our prime purpose is to present to the liquefied petroleum gas distributor as broad a picture as possible to aid him in determining the feasibility of engaging in this business in conjunction with his present LPG operation. An effort has been made to present the facts as research and personal experiences reveal them. As in all other lines of endeavor, there are both favorable and unfavorable factors involved and in the final analysis, the individual distributor must decide for himself what course to pursue. He, of course, will be influenced in his final decision by his own ability to meet the problems of such an undertaking.

Capital Included

These problems will include sufficient capital for a major investment in storage and application equipment, and in the product, itself.

A satisfactory contract with a producer for ample supply.

A sales territory not too cramped by competition and of large potentiality.

A thorough knowledge of soil conditions and fertilizer requirements in the local area.

A basic understanding of the characteristics of the product so that safe operation can be maintained.

And—a strong will to win!

Table 2.
Capital Requirements*.

Equipment	Cost
30,000-gal. AA storage tank, with fittings, compressor, piping, etc.	\$10,000
Foundations for tank	750
Site improvement	500
Installation labor	500
Total, installed	\$18,500
6 1000-gal. storage tanks at \$450 each	2,700
6000-gal. transport	7,500
8-ft pull type applicator, with 107-gal. tank, rigid tool bar and 3-coil shank assembly	575
14-ft pull type applicator, complete with 107-gal. tank, tool bar and 4-coil shank assembly	620
8-ft Hi-clearance pull type applicator, complete	620
14-ft Hi-clearance pull type applicator with 4-coil shank assembly	675
3-point hitch model 8-ft semi-mounted applicator	540
3-point hitch model 14-ft semi-mounted applicator	656
Rear-mounted 8-ft Ford, Ferguson applicator, complete	382
Tractor-mounted applicator, with 107-gal. tank, tractor frame, three knives and all fittings	320

Table 3.
Properties of AA at Various Temperatures.

Temperature (°F.)	Vapor Pressure (psig)	Gas Density at atmospheric pressure —cu ft/lb	Liquid Density lbs per cu ft	Latent Heat (BTU/lb)
—28	0.0	18.0	42.57	589.3
—20	3.6	—	42.22	583.6
—10	9.0	—	41.78	576.4
0	15.7	19.3	41.34	568.9
10	23.8	19.8	40.89	561.1
20	33.5	20.2	40.43	553.1
30	45.0	20.5	39.96	544.8
40	58.6	21.1	39.49	536.2
50	74.5	21.6	39.00	527.3
60	92.9	22.0	38.50	518.1
70	114.1	22.5	38.00	508.6
80	138.3	22.9	37.48	498.7
90	165.9	23.4	36.95	488.5
100	197.2	23.8	36.40	477.8
110	232.3	24.2	35.84	466.7
120	271.7	24.6	35.26	455.0
130	315.6	25.5	34.66	443.0
140	364.4	26.4	34.04	430.0

*Prices based upon average prices during past year. Estimated by the J. B. Beaird Co. Inc., Gotcher Engineering and Manufacturing Co. Inc., and John Blue Co. Inc.

Data taken from Bureau of Standards Circular No. 142.



About anhydrous ammonia plants, such as the one above belonging to Phillips Chemical Co., Adams Terminal, Houston, obtain hydrogen from a combination of natural gas. Hydrogen can also be generated from oil.

Anhydrous Ammonia: Supply and Distribution for Agricultural Use

By L. H. Wright
Phillips Petroleum Co.
Bartlesville, Okla.

WHILE the use of anhydrous ammonia as a source of nitrogen for fertilizer was first practiced in 1930 and since the early '30's has been in practical use, particularly in California and the Mississippi Delta, the increased distribution of the product throughout most of the major farming areas in the United States during the past five years has caused widespread interest in the possible future expansion of the use of this high nitrogen content product as an important source of nitrogen for agriculture.

A great number of liquefied petroleum gas distributors have become interested in the distribution of anhydrous ammonia probably because of the similarity in the equipment and methods used in handling the two products. Their interest might further be attributed to the specialty selling methods required to sell the two products, although obviously there is a wide difference in know-

ledge required in fully understanding the sales points of the two. The following paragraphs cover some of the pertinent details regarding anhydrous ammonia, about which liquefied petroleum gas distributors usually inquire.

What Is Anhydrous Ammonia?

Anhydrous ammonia is the compound formed by the combination of the two gaseous elements, nitrogen and hydrogen, in the proportion of one part of nitrogen to three parts of hydrogen by volume. Since one volume of nitrogen weighs 14 times as much as one volume of hydrogen, the ratio is 14 parts of nitrogen to three parts of hydrogen, or about 82% nitrogen to 18% hydrogen, by weight. These facts are shown in the chemical symbol for ammonia, NH_3 . The purity of ammonia exceeds 99.95% NH_3 for the refrigeration grade and exceeds 99.50% NH_3 for the commercial grade.

Ammonia is available in two forms—anhydrous and aqua. Anhydrous ammonia does not contain water. It

may be in gaseous form or in compressed and liquefied form. It should not be confused with aqua ammonia or ammoniacal liquor which is a solution of ammonia gas in water. The most common concentration of aqua ammonia used in commerce contains 25% NH_3 , or 20.5% nitrogen, by weight.

Raw materials required for the manufacture of anhydrous ammonia consist of (1) hydrogen—which in most present-day plants is obtained from natural gas but may be generated from oil, coal, coke, wood, etc., and (2) nitrogen—normally obtained from the air. Steam is used in the manufacturing process, supplying a portion of the required hydrogen. Heat and pressure are other necessary fundamentals in the process.

Manufacturing Process

The most commonly used process is illustrated in Fig. 1. Natural gas, steam and air are reacted at elevated temperatures to yield a gaseous mixture composed chiefly of hydrogen, nitrogen, carbon dioxide and carbon

monoxide. After the carbon oxides and the minute quantities of other impurities have been removed, the pure hydrogen and nitrogen, in the ratio of approximately three volumes of hydrogen to one volume of nitrogen, are passed over a catalyst at high temperature, and the conversion to ammonia occurs. The gaseous ammonia thus formed is cooled, compressed, and liquefied, then stored and transported as a liquid under pressure.

Production Facilities

The first commercial plant to produce ammonia by the reaction of hydrogen and nitrogen was started in Germany in 1913. Starting in the mid '20's, the manufacture of synthetic ammonia in this country expanded

gradually prior to World War II. During the war the synthetic nitrogen production capacity of the United States expanded almost four-fold, to a capacity of approximately 1 million short tons annually. Plants were strategically located throughout the country and at points accessible to important defense centers and agricultural areas.

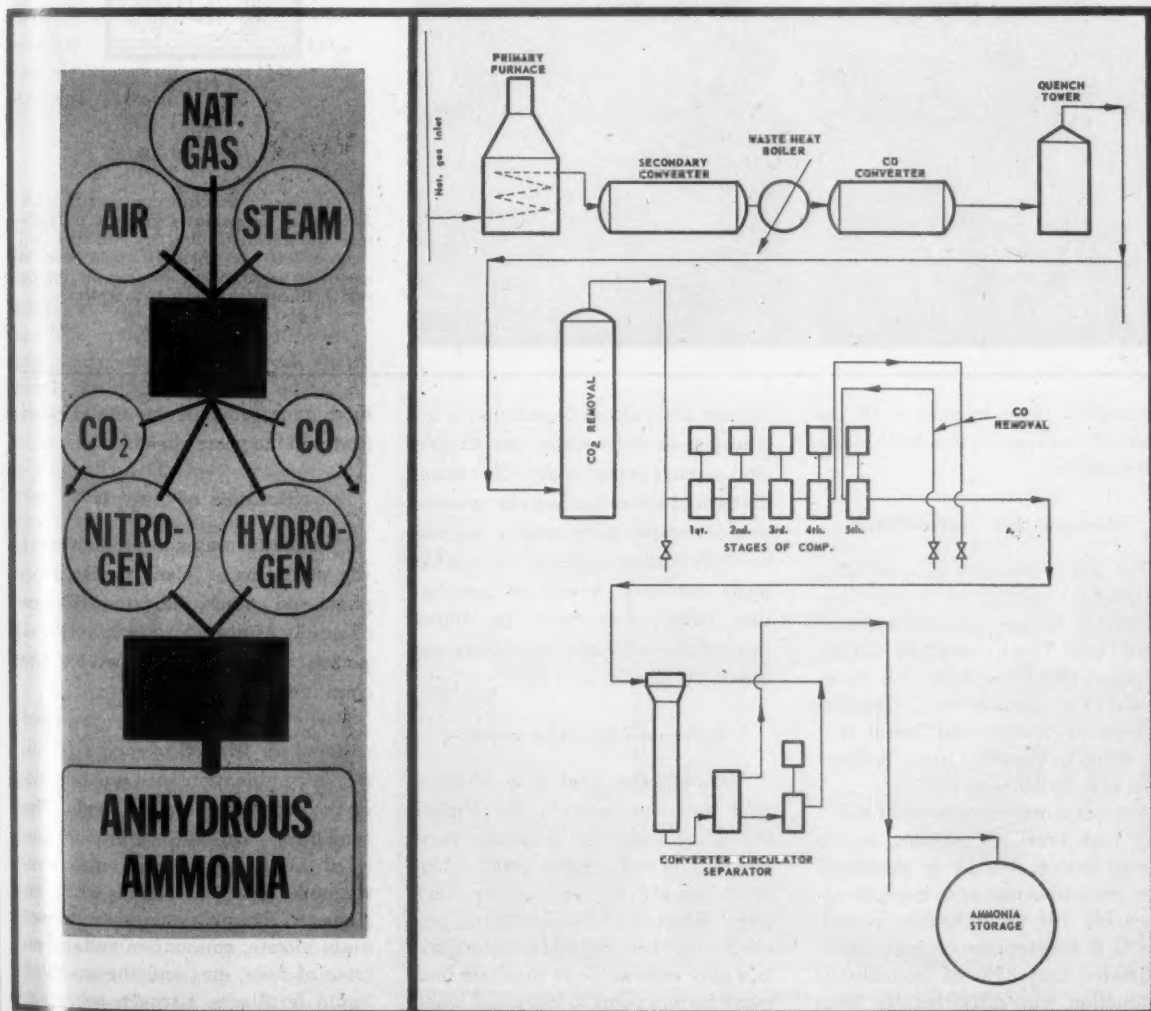
Increased demand for nitrogen in the late '40's coupled with long-range defense plans resulted, in 1951, in a government sponsored program to increase the then available synthetic nitrogen production capacity from 1.5 million tons to a capacity of 2.8 million tons per year, with completion of the program scheduled for 1955. The program has further been expanded during the past year with

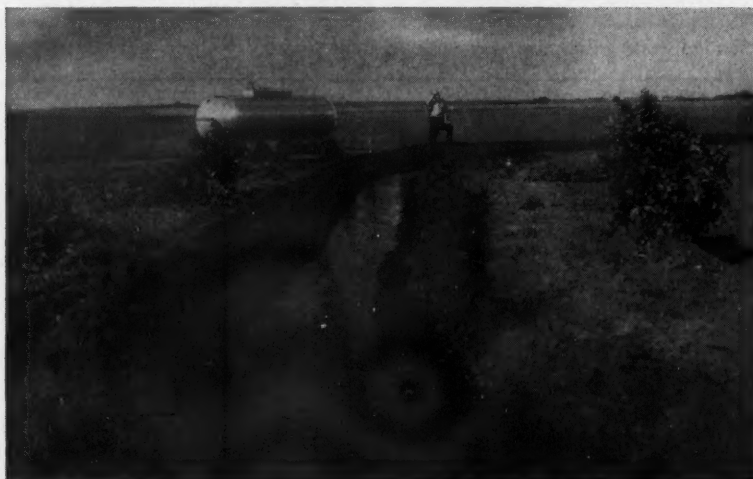
an ultimate goal of approximately 3.25 million tons of synthetic nitrogen by 1957. The expansion, when complete, will result in a total of approximately 60 synthetic ammonia plants large and small, located in some 20 states.

Nitrogen Supplies

This synthetic nitrogen production, plus additional supplies from by-product and organic sources, is designed to attain a production goal of 3.5 million tons of nitrogen annually, of which some 2.5 million tons are estimated to be required for agriculture, with the remainder to be consumed by industry for defense and miscellaneous use. The trend toward increased use of nitrogen by agriculture indicates that the demand will remain in

Fig. 1. Flow diagrams of anhydrous ammonia manufacturing process.





Application of Anhydrous Ammonia



Fig. 2

Anhydrous ammonia is used as a fertilizer by injection directly into the soil (above left) or through application in irrigation water, below left. Fig. 2, (above right) illustrates these two methods.

reasonably close balance with the planned increase in available nitrogen supplies.

Nitrogen for Agriculture

The use of nitrogen as a fertilizer material for agriculture is very closely related to use of other so-called plant foods. These consist of: *Major*: Nitrogen (N), Phosphate (P), Potassium (K); *Secondary*: Calcium, Magnesium, Sulfur; and *Trace*: Boron, Cobalt, Copper, Iron, Sodium, Zinc, and Manganese.

Assuming maintenance of a reasonably high level of economy in the United States, it is likely that fertilizer use will continue to increase appreciably for an indefinite period. The U. S. Department of Agriculture estimates that 25% of agricultural production currently results from

the use of fertilizer. Population is increasing steadily while the tillable land acreage is stationary. This situation would indicate a need for greater production per acre, and as the soil becomes further depleted of available plant nutrients, it will be essential that more plant foods be added through the increased use of commercial fertilizers.

Increased Requirements

Although the total tons of plant food nutrients used in the United States are great, the quantities used per acre are still quite small when compared with fertilizer use in many other countries where farming has necessarily become more intensified. It is only reasonable to conclude that many factors point to increased plant

food requirements in the United States in the years ahead.

Balance of Supply

Planned increases in production of the other major plant foods, phosphate and potash, indicate a balance of supply of nitrogen, phosphate and potash and assure support for the continued use of nitrogen.

Forty to 45% of the nitrogen used as fertilizer is used in mixed fertilizer, in combination with one or both of the other major plant foods. The remaining 55 to 60% is directly applied through one of the various nitrogen fertilizer compounds which include the dry materials urea, ammonium nitrate, ammonium sulfate, nitrate of soda, etc., and the so-called liquid fertilizers, nitrogen solutions,

aqua ammonia and anhydrous ammonia. The use of anhydrous ammonia as a direct application nitrogen fertilizer has rapidly increased during recent years as indicated by the following:

Year	Tons (Nitrogen)
1947-48	43,373
1948-49	65,696
1949-50	85,516
1950-51	118,423
1951-52	168,273
1952-53	217,182
1953-54 (estimated)	325,000

The nitrogen content of the 1952-53 anhydrous ammonia tonnage represents approximately 15% of the total nitrogen used in all fertilizers and 25% of the nitrogen used as a fertilizer for direct application. Anhydrous ammonia is used as a fertilizer by injection into the soil or through application in irrigation water (see Fig. 2). Equipment for the direct application of ammonia to the soil is now produced by several well-known manufacturers. Tractor attachments have been developed for convenient attachment and economical cost.

Distribution

Anhydrous ammonia used as a fertilizer—agricultural ammonia—is usually distributed through bulk plants which are quite similar to the plants used for storing and distributing propane. The equipment for handling anhydrous ammonia differs from that used in handling propane principally through the complete absence of copper or brass fittings on ammonia installations. Ammonia decomposes brass; consequently, all-steel tanks, fittings, pumps, compressors, etc., are used in the storage and handling of ammonia. While it is possible to use ammonia storage for storage of liquefied petroleum gas, alternate use has not been practiced nor recommended.

Dual Usage

The necessity for extreme care and thorough, careful purging before propane or butane is placed in tanks which have been used for ammonia, and the fact that in actual operation little, if any, opportunity presents itself for dual use of storage have combined to indicate that such practice is impractical. Standards for the storage and handling of anhydrous am-

monia have been developed by the Compressed Gas Association and the Agricultural Ammonia Institute. These standards have been generally accepted by the industry and regulatory authorities as the basis for safe practices in storing and handling the product.

Plant investment required for storage and handling of ammonia compares favorably with investment for similar facilities for propane. A rule of thumb used in determining storage capacity indicates two 30,000-gal. capacity storage tanks to be necessary for distribution of 12 cars of ammonia per year, purchased at the rate of one car per month. Fertilizing practice traditionally limits the season to three to four spring months, necessitating the storage of several months off-season shipments. The effect of weather upon crop growth and soil condition has a corresponding effect on permissible times for application of ammonia which, in turn, places emphasis on the vital importance of having the ammonia supplies stored at the point of distribution. Recent developments indicate the practicability and advisability of fall application of nitrogen for pastures and small grain and applications of nitrogen during fall plowing, practices which tend to extend the ammonia distributor's period of sales activity.

Investment for the two 30,000-gal. tank type bulk plant indicated above is usually of the order of \$25,000 to \$30,000. In addition, the ammonia distributor usually owns cylinders or tanks, applicators, tractors, trucks, inventory, etc., which total \$15,000 to \$20,000.

Rules for Success

For those who have located a suitable local market and are interested in putting in the necessary capital for ammonia distribution facilities, it appears that the business presently offers the three fundamentals for success, namely:

1. Projected adequate supply of product—Presently active program of expansion to be completed in 1957.
2. A large potential market—Continued expansion in the use of fertilizer.
3. A saleable product, having excellent consumer acceptance—
 - (a) Anhydrous ammonia offers the farmer an economical source of nitrogen, convenient to use.
 - (b) Use of nitrogen fertilizer is essential to good farming practice and is a sound investment, returning \$2 to \$4 for each dollar invested.



An anhydrous ammonia distributor's bulk plant, showing storage and field tanks and delivery trucks.

Question	1. Attala Butane Gas Mississippi	2. Sacra Bros. Co. New Mexico	3. Planters Oil Co. Arkansas
<i>Is there an advantage in being in the LPG business when you handle anhydrous ammonia?</i>	Yes.	—	No, except that same pressures are involved and both are handled similarly.
<i>If your answer is "yes" state reasons why.</i>	Familiarity with product having similar characteristics. Knowledge of sound safety information. Established farmer clientele to sell to.	Similarity of product to propane in pressure. Using same type of vessels and personnel trained in handling a high pressure product gives definite advantage to LPG dealer to take on AA. Practically all our LPG customers are potential AA users.	If farmers are being sold LPG, you would have a customer list already built up that would make for easier selling.
<i>Must you know soil conditions in your locality and crops benefited by AA to sell prospects?</i>	By all means. We work with the county agent and state college in obtaining soil samples for analyses and try to follow their recommendations as to amount of plant food to add.	Definitely.	Soil must be nitrogen-deficient to sell AA, as it is nitrogen only.
<i>Must you be able to instruct farmer on how and when to apply AA and in safe handling?</i>	Yes. We have experienced men to either apply AA for the farmer or show him how to apply it. We use state college recommendations for when and how much to apply.	The characteristics of the product make it a must in instructing farmers how to use it safely. Our salesmen keep close check all the time the application is being made, especially with new customers. This is expensive but will pay off in the long run.	Yes. Sometimes takes several years to show the farmer when to apply as he has his own ideas, regardless of all tested ideas tried beforehand. Some of them will do the reverse regardless of tested experimentation because it is not in line with their thinking as to time and method of application.
<i>To sell AA to the farmer and help him, do you need salesmen other than those for your LPG business, or can you use same sales force?</i>	The same sales force works nicely for us but it would depend upon type of LPG operation the dealer has. In the Delta area with huge tractor conversion program, the need would vary.	We use agricultural school graduates to sell AA.	Can use same sales force if they have time to devote to it.

Attala Butane Gas Co.'s anhydrous ammonia transport, two 1000-gal. tanks, small delivery unit and tractors with applicators near company's plant in Kosciusko, Miss.



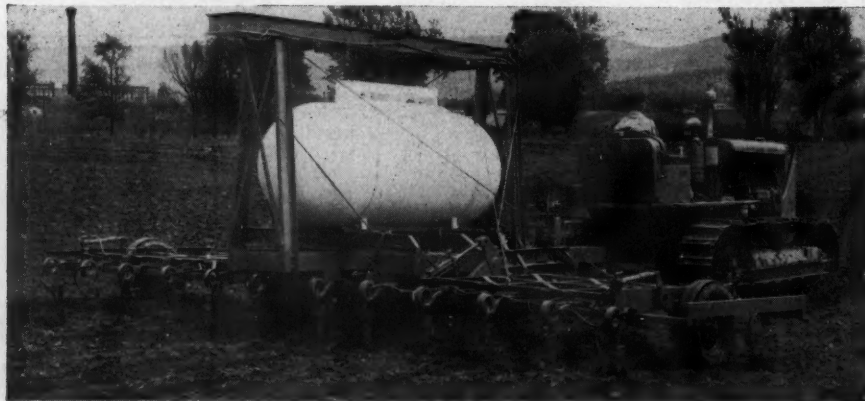
LPG bulk plant operators, handling anhydrous ammonia, reveal their actual experiences in reply to Butane-Propane News questionnaire.

Question	1. Attala Butane Gas Mississippi	2. Sacra Bros. Co. New Mexico	3. Planters Oil Co. Arkansas
<i>Do you need other service men?</i>	We use the same service men. We have very few service calls for LPG in summer and none for AA in the winter.	No.	Need someone familiar with applying equipment and pumps that apply it.
<i>What amount of storage, how many transport and delivery trucks and trailers do you think necessary for a successful operation?</i>	A successful operation can begin with a very small amount of equipment. With transport facilities available such as we have, an operation could begin with one or two 6000-gal. tanks and one or two farm tractors with mounted tanks on trailers to take to the field. A delivery truck can be added after tonnage builds up enough to justify it.	That, of course, would depend upon the demand and supply. I think it would be best to start with a minimum and gradually expand. This would work along the same trend of an LPG business.	We have two 30,000-gal. storage tanks. No tank trucks. Farmer comes in with own trailer and hauls his own. This would depend on local conditions. We weigh it in and cut like coal or grain. Hard to do with tank truck delivery and be accurate.
<i>How much storage have you, and what other facilities? How is your plan working out?</i>	We have one 30,000-and four 6000-gal. storage tanks, with one delivery truck and one transport, six farm tractors with applicators and trailers. We plan to add more tractors and about two more delivery tanks on idle LPG trucks next spring. We started with one 6000-gal. storage tank and one 1000-gal. trailer. Ours is about 75% custom operation.	That, of course, would depend on the demand and supply. I think it would be best to start with a minimum and gradually expand. This would work along the same trend as an LPG business.	We have 60,000-gal. of storage. Plan working out pretty good although we cannot get farmer's cooperation as to how much he'll need in a season and other things along this line. He wants you to have it for him when he needs it and if you get stuck with an over-supply it's your worry. Not cooperative enough.
<i>Do you sell or lease trailers or skid tanks, cylinders or other storage vessels to customers?</i>	We lease trailers to some extent but prefer to apply the AA for the farmer. That gives our surplus LPG labor something to do during our slow season. We also sell equipment to the farmer if he wants to apply his own ammonia.	At present the trailers are loaned to customers.	Sell trailers only. Have one or two professional applicators we loan trailer tanks to in order to get them to handle ammonia application for us. We carry their ammonia credit until completion of a job and then they pay us. On large accounts this might require quite a large extension of credit.
<i>How much capital do you think necessary to start in business?</i>	\$10,000 to \$12,000 for small custom operation up to \$100,000 for large operation.	\$10,000 minimum.	Depends on amount of equipment one is buying and bank credit obtainable.

Lovington, N. M., anhydrous ammonia and LPG plant of Sacra Bros. Co. includes office building, LPG bulk plant (spheres), NH₃ storage and transportation equipment.



Question	1. Attala Butane Gas Mississippi	2. Sacra Bros. Co. New Mexico	3. Planters Oil Co. Arkansas
<i>What is the necessary minimum equipment in gallons of storage and units of trucks, trailers, applicators, etc.?</i>	Depends on expected sales and whether it is a custom operation or straight sales. A new territory will have to be developed and the customers educated before any large volume can be expected. A small operation can be started with one or two 6000-gal. tanks and expanded as volume grows. This would require one or two tractors with applicators and trailers for custom operation.	10,000 gal. storage, four applicators, six trailers, no trucks, one pickup, plus any number of water applicators.	Depends on locality availability of ammonia, etc.
<i>Are you operating under a contract with a producer that will guarantee you an ample supply of AA throughout the season?</i>	AA supply is on a 1½ to 1 ratio basis similar to LPG. The supply situation is much better than it has been for some time.	Yes.	Yes, insofar as the producer is able to deliver. Can be disrupted by strikes, etc. Not definite, as too many things can happen.
<i>How much product do you take per month?</i>	We take 100 to 150 tons during the off-season (July through January) which gives us one and one-half that much, plus our stored product, to sell during the rush season.	Approximately 15,000 lb.	Depends on amount of storage.
<i>Do you have to accept the product on regular monthly shipments or can you order as needed?</i>	We let the producer specify the time during off-season when we fill our storage. We order the product as we need it during the rush season.	Order as needed.	Take as need it. However, we try to cooperate with supplier as far as we can.
<i>By selling AA in the spring and summer months when the average LPG dealer's load is lowest, are you neglecting opportunities to build your summer LPG load, or do you add enough salesmen to enable you to do both jobs creditably?</i>	We only add men as they can be used in both services. We keep a minimum number of employees busy in our LPG business the year around. The extra labor required during peak LPG season is what we channel over to AA in the summer. This enables each one to pay his way all the year.	LPG should not be neglected, as the potential tractor load is very large. Our company sells 2 gal. in summer to 1 gal. in winter, due to tractor and irrigation load.	Try to watch both as closely as we can.



John Blue "wide-shooter," 24-ft wide Wheatland applicator, shown applying 65 lb of ammonia per acre, equipped with 25 applicators spaced on 12-in. centers. Depth of application is approximately 6 in.

Question	1. Attala Butane Gas Mississippi	2. Sacra Bros. Co. New Mexico	3. Planters Oil Co. Arkansas
<i>Do you advise other LPG dealers to take on AA as a sideline?</i>	That depends on location and circumstances but we think the average dealer is making a mistake not to at least investigate the matter. He is like the farmer using the one crop system.	Yes.	It is a good spring sideline if in a good farming community and able to finance the operation.
<i>To do so, should a dealer have ample capital of his own or is it feasible to borrow capital, using present LPG facilities for security of loans?</i>	We preferred to borrow to some extent because we were having to borrow every summer anyway. We had always lost money in the summer until we started AA business but have made money the past two summers. To most of us as small dealers, it is just a question of borrowing money to cover our losses or borrowing money to attempt to eliminate those losses.	I think it would be feasible to borrow capital.	Can borrow. This is only way we have been able to do it. Tanks can be financed on 10% down, 36 months to pay. Let business pay it out. Only way we ever bought anything.
<i>How does your present volume of AA sales compare with your LPG sales?</i>	Present volume is very small compared with LPG sales but is growing much faster. We hope to get AA sales up to 50% of LPG within a couple of years but don't know if it is possible. That will probably throw everything out of balance the other way.	About 8% AA and 92% LPG.	Do not know. Only been in business a few months. Unable to furnish a comparison.
<i>If you had to concentrate on just one line which would it be?</i>	Probably AA, although that is a hard question. AA is put out in good weather while LPG is mostly in the worst weather, but will require deficit financing over more months per year than LPG.	LPG at present. However, AA has a potent future.	LPG's selling season is longer, profit margin longer, a year-round business.
<i>What safety precautions do you take to prevent interchange of equipment in handling both LPG and AA?</i>	Motor vehicle comptroller uses different kinds of approved tags for each one. If we should change a unit from one to the other, we have it steamed, get a certificate showing it to be completely free of any product, change the fittings, and have our insurance company engineer and MVC inspector notified of the change. Other services that we render our customers include combine service for harvesting seed, numerous small tools to help them with, such as mower, bush hog, cultipacker, lime spreader, rotary hoe, flame cultivator, poison gun, and we have forage harvesters that we use with the tractors and trailers to harvest silage and put it in the silo for the farmer. This fills in pretty nicely the open spaces between LPG and AA.	AA equipment is kept completely separate and personnel is instructed not to interchange under any condition.	Separate pumping equipment and separate handling equipment all the way around. A separate business altogether, although we handle all of it on same location and with same personnel.



L. E. Townsend
Planters Oil Co.
Manila, Ark.



Butane-burning tractor of Attala Butane Gas Co. pulling a pasture applicator for seeding at the same time NH_3 is injected into the soil.

Make Careful Study Before Entering A A Field

By Peter Wile
New York District Manager

ANHYDROUS ammonia (NH_3) is a readily liquefiable compressed gas very similar to propane in many of its characteristics. A clear, colorless liquid like propane when kept under moderate pressure, it vaporizes readily at normal atmospheric temperatures when this pressure is released. The vapor pressures of the two gases are almost identical between 32° and 90° F. Ammonia boils at -28° F, propane at -44° F. Method of handling and the tanks used for storage and transportation are also similar.

In spite of these points of similarity there are also important points of difference:

1. Propane is a flammable gas; its usefulness depends mainly on that fact. An ammonia concentration of 16% to 25% in air can be made to burn under carefully controlled laboratory conditions, but the Interstate Commerce Commission rates it a "non-flammable" gas.

2. Ammonia is toxic; propane is not. Ammonia's pungent odor makes it its own warning agent. Its presence is so readily detected even in extremely low concentrations that humans, without any urging, automatically keep away from any dangerously toxic concentrations.

3. As a gas, ammonia is about two-thirds the weight of air while propane is 50% heavier.

4. The high latent heat of ammonia makes it an excellent refrigerant.

Table 1 comparing these two gases, may be of interest to the technically minded.

Is There an NH_3 Potential?

The ability to handle L.P. gas profitably is not a guarantee that NH_3 can also be handled profitably. The L.P. gas man considering the possibility of handling NH_3 should give

One of the nation's largest anhydrous ammonia distributors gives a vivid explanation of what to expect in this business from capital investment and competition to storage problems and soil requirements.

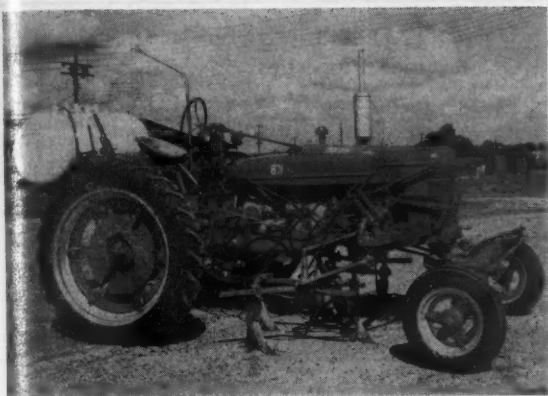
thought to many things of which the following are a few highlights:

The company considering the distribution of ammonia should carefully study the territory to determine if it has agriculture of the right type and sufficient acreage to provide a market. Practically all crops need nitrogen but it is much easier to apply ammonia to some crops than it is to others. Certain types of pasture can use large quantities of nitrogen, but pasture application is not as simple as application to other crops.

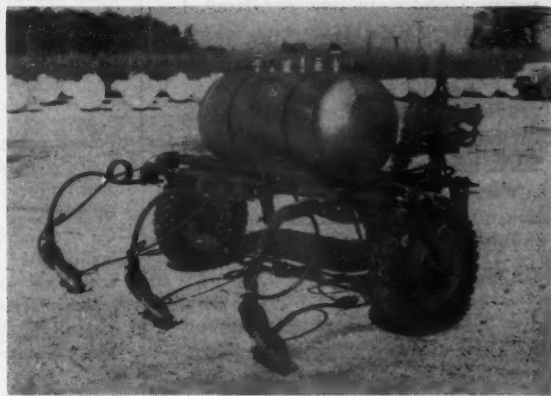
A study should be made to determine if there are any other ammonia distributors in the territory and how close they are. Generally speaking, it is economical to locate ammonia bulk plants 40 to 50 miles apart in most parts of the country. Fifteen miles is perhaps a minimum operating radius even where there are large crops of corn raised using great quantities of nitrogen, as in the middle-western states. In considering



Suburban Farm Service Co.'s truck ready to leave for an anhydrous ammonia application job in the Delmar, Dela., district.



Tractor and applicator are ready to inject anhydrous ammonia into the soil.



Closeup of an anhydrous ammonia tank mounted and ready for the application of fertilizer to corn land.

other NH_3 distributors, bear in mind that several of the big NH_3 producers, in order to dispose of their plant outputs, are setting up their own retail outlets through their own bulk plants. These outlets may be expected to get a share of the business in the marketing area they serve.

The ammonia distributor should also study the competition he may expect from other forms of nitrogen. Nitrogen solutions compete with ammonia in many parts of the country. These solutions are used by dry fertilizer formulators to compound certain dry fertilizers, so they already have storage installed. Because of this handling, low prices are common.

Dry Fertilizer Distribution

Competition should also be expected from the dry fertilizer people. Dry fertilizer is usually sold on a far lower margin than is customary for LPG distributors (as a commodity, rather than a service). Ammonia is not an all-purpose fertilizer as all plants need phosphorus and potash in addition to nitrogen and many soils lack the so-called "trace elements" (see Table 2). Most fertilizer outlets are accustomed to selling mixed fertilizers containing nitrogen, phosphorus and potash in varying relationships to suit different soil and crop conditions. The sale of "mixed goods" is more profitable than of single element fertilizers, so these people may look with suspicion on the introduction of NH_3 .

The use of increased quantities of nitrogen is relatively new, which means that ammonia must be intelli-

gently sold. If the sales department pushes the use of extra nitrogen without due regard to the lack of other important plant nutrients, poor results may be obtained. A single mistake of this sort might set a distributor back for several years. Remember that a crop failure today, with high wages, heavy use of fertilizer, and expensive farm equipment to pay out, means a serious monetary loss to the farmer.

It also should be realized that even though the ammonia market will grow considerably, in many territories part of the "bloom" may be off, i.e., many of the better areas are already served. The L.P. gas man is not the only one interested in diversification. There are many other types of business which feel that NH_3 fits in with their other products. Seed corn producers, farm equipment distributors, oil and gasoline jobbers are among them.

A large investment in storage equipment is required because of the peak load characteristics of the industry. Liquefied petroleum gas people think of the house heating load as being highly seasonal and, in fact, it is. It cannot, however, be compared with the sale of anhydrous ammonia as a fertilizer. With house heating, the two heaviest months are December and January, each taking 20% of the total for the 8 month season. The other six months take the other 60%. Compare this rather mild peak with the ammonia peak in some sections of 80% in two months, the other 20% over four months, and no sales for six months.

Storage facilities can be provided by the use of large 30,000-gal. capacity tanks or even refrigerated spheres of very large capacity (a large producer has a million-gallon-capacity sphere on the West Coast). A distributor should have enough storage capacity to take monthly shipments of ammonia in either the 30,000-gal. capacity tank or in customer tank capacity. A 30,000-gal. tank holds about 70 tons of ammonia. Investment cost per ton of storage is about \$160.

Tanks of 500 and 1000-gal. capacities are usually standard for farm use. Such tanks must be built for 265-psi working pressure if they are to cross state lines. The 500-gal. size may cost \$250 to \$300 and holds 1.1 tons of NH_3 ; such storage costs \$230 to \$280 per ton of NH_3 . The 1000-gal. size is somewhat lower in price compared to capacity, but frequently requires trailers which the distributor often must supply.

Interchangeable Storage

The method of shipping and storing ammonia makes it almost impossible to use ammonia tanks interchangeably with propane tanks. Although a tank built for ammonia is satisfactory for propane, some propane tanks are not suitable for ammonia. Since 1940, propane tanks have been built to ASME U-68 or U-69 code specifications for a design working pressure of 200 psig. In most states these tanks are constructed as "unfired pressure vessels," equipped with relief valves with a start-to-discharge pressure setting of 125% of 200 or 250 psig. Most

propane tanks are now constructed under the ASME 1952 code, which differs from the old code in that it has a 4-to-1 factor of safety rather than the 5-to-1 of the U-68 to 69 construction. Under the new code, propane tanks are built for 250 psig dwp.

Where customer tanks cross state lines in interstate commerce, neither the old nor new code propane tanks are satisfactory for ammonia because ICC requirements are for 265 psig dwp. The use of ammonia tanks for storage during the off-months and for distribution during the peak months, keeps them busy most of the time.

In transferring from one service to the other, it is necessary to purge tanks carefully, and propane fittings are not satisfactory for ammonia since only steel or iron and a few aluminum alloys can be used with ammonia. The use of brass with ammonia is extremely hazardous and should never be permitted since it crystallizes rapidly in contact with ammonia. It is possible to use tank cars, transports and perhaps tank trucks interchangeably, but a complete purging job is required each time the type of service is changed, and the fittings must be satisfactory for both services or be changed at the time the changeover is made.

Serious Storage Problem

The storage problems for the two materials are very different. Two weeks' supply at the plant is considered liberal LPG storage capacity, although, depending on the service method employed, average storage at customer's location may be as much as two months' supply. In many cases, however, the customer owns this inventory. At any rate, with propane, a 4-to-1 ratio of sales to inventory is reasonable to expect and many companies do far better. With NH_3 a 1.5-to-1 ratio is reasonable, 2-to-1 is good, and 2.5-to-1 is unusual.

The peak load for NH_3 is out of proportion compared to that for L.P. gas. Despite this fact, the ammonia producers expect to ship ammonia to the distributor in approximately equal monthly quantities.

Ammonia manufacturing plants are expensive to build and thus must operate at a reasonably uniform rate throughout the year to pay out this investment. If the product isn't taken

TABLE 1
Average Properties

	Commercial Propane	Anhydrous Ammonia
Pounds per gallon at 60° F.....	4.24	5.14
Specific gravity of gas compared with air.....	1.52	.59
Specific gravity of liquid at 60° F.....	.509	.617
Cu ft of gas per gallon liquid.....	36.28	113.4
Cu ft of gas per lb.....	8.55	22.1
Boiling point 0° F.....	-51° F.	-28° F.
Latent heat per lb.....	185	589
Vapor pressure psig at 0° F.....	28	16
Vapor pressure psig at 70° F.....	124	114
Vapor pressure psig at 100° F.....	192	197

TABLE 2

Major Elements		Trace Elements	
Nitrogen	Calcium	Iron	Copper
Phosphorus	Magnesium	Manganese	Boron
Potash	Sulphur	Zinc	Molybdenum

TABLE 3
Comparative F.O.B. Prices

	Propane*			Ammonia**		
	Per Gal.	Per Lb	Per Ton	Per Gal.	Per Lb	Per Ton
Group III	\$ 0.03	\$.0070	\$14.00	\$.225	\$.0440	\$ 88.00
Newark .....	.075	.0177	35.40	.2585	.0503	100.60
Baltimore .....	.075	.0177	35.40	.2495	.0486	97.10

*Propane prices from National Petroleum News.
**Ammonia prices from Oil Paint and Drug Reporter.

it can't be burned for fuel in the plant, stored in the ground (experimental work on underground storage is underway) or go into some other product such as butane into gasoline. As a matter of fact, an ammonia plant produces NH_3 as a prime product while the refinery or gasoline plant usually produces L.P. gas as a co-product or by-product.

Methanol is an alternate product for NH_3 production facilities but the plant must make one or the other; it can't make both simultaneously in the same "train." The switch-over, which is costly, must be complete, and in the last year has not been feasible because of the lack of demand for methanol.

Production Costs

As the NH_3 production facilities expand (and they have greatly expanded in the last two years with many new plants soon to come on stream), the possibility of using any large part of the capacity to produce methanol will further decrease. Today's price f.o.b. manufacturing plant and delivered to eastern plants is perhaps the most convincing argument as to the relative production costs.

Table 3 is an approximate comparison.

Thus, the properties of ammonia and propane are at once much alike and very different, and the same can be said for the distribution methods for the two gases. The handling of the two is so similar that LPG operating people readily learn to handle NH_3 . The sales and delivery problems, however, are quite different. A propane salesman is not readily adapted to sell NH_3 . Propane is a convenience which the farmer buys to make life more pleasant for himself and his family, while NH_3 is one of the several raw materials he must feed into his "factory" to produce crops. NH_3 supplies only the nitrogen requirements. The farmer also must supply phosphate, potash, and lime, as needed, as well as several so-called trace elements.

In summary, it can be stated that the agricultural ammonia business has good possibilities but probably requires a higher investment in relation to sales than the L.P. gas business and may show a slower payout. It requires intelligent selling and careful planning if it is to show a profit.

Established Farm Accounts Best Asset For Selling Anhydrous Ammonia

By B. N. Muncy Jr.
Artesia Gas & Appliance Co.
Artesia, N. M.



WHEN the idea of handling anhydrous ammonia first came up, it was felt that there were a number of advantages to us as LPG dealers. This has since been proved, but in certain ways only.

The fact that some equipment can be used in both operations is of very little advantage, as the cost of changing fittings and steaming tanks more than offsets the additional investment of special tanks.

Most companies that have their own transportation can use one of their tractors to transport ammonia during the off-season in LPG sales, as most of the ammonia is sold during the months of the least LPG load. I do not believe that a dealer can purchase transportation equipment for ammonia unless he is already in the LPG transportation field, or until his ammonia volume becomes large.

Having established farm accounts for LPG has been our most important single advantage in breaking into the ammonia field. Most of the farm accounts in this area have been, or are now, customers for LPG; and it was this list of potential customers that

has formed the basis of our business.

Last year was the first year ammonia had been used in this area and more of our business was sold on our reputation in the LPG field than on the merits of ammonia as fertilizer. The fact that the present personnel is familiar with the characteristics of ammonia, due to their familiarity with LPG, has been of very little help, as we have found that it is necessary to put men in the field that have a much greater knowledge of agricultural problems than do any of our present LPG employees.

College Training

I think that we have been completely convinced that the only approach in a new area is to put men in charge of the ammonia operation who have college degrees, or at least college training in agriculture. In starting marketing operations in a new area, it is vitally necessary to have men who understand soils and crops in order that they cannot only recommend the correct amounts of ammonia, but also make certain that

the farmer or our organization puts it on correctly. An incorrect application can render the product useless.

Ammonia is only one of the three major plant foods that are necessary to most crops. The farmer must be sure that the plants receive these other two plant foods in proper quantity, or, again, the value of the ammonia will be lost.

We have used the present LPG sales force to some extent, and our LPG delivery and service men have been of great help in getting the farmers to think about ammonia and watching results on other farms in their area. These men are not used to close a sale, but only to keep the farmers talking, and to give leads to the ammonia salesmen. The only other employees necessary are men to drive the tractors used in application.

Help Wanted

If there is a large amount of ammonia applied in irrigation water the amount of help needed will be increased somewhat, as quite a bit of time will be consumed in checking the rate of flow, and the regulators require considerable maintenance.

The amount of storage necessary to operate a successful ammonia business is directly related to the amount of ammonia that can be sold in the area. As with many butane contracts, ammonia is sold on a quota basis, with the dealer usually being allowed not more than 125% of his off-season purchases during the sales season.

Therefore, if a dealer can sell 225 tons of ammonia during the on-season, he must buy 100 tons during the off-season: this determines his storage requirements.

Our area is primarily a cotton producing section, and the major portion of our sales occur during the on-season. Therefore, we have need for a sizeable storage plant. At present we have a 30,000-gal. tank on the railroad siding in Artesia, and 9500 gal. storage at our branch 150 miles away.

With stationary storage we can use our trailer tanks. We have nine of the 1000-gal. size, thirty-seven 500-gal. and three 287-gal. This total gives us the storage needed to balance our purchases under the on-off-season quotas.

A great deal of the ammonia used



Cotton is sidedressed with anhydrous ammonia very late in the season.



Ammonia trailer is ready for irrigation water application of anhydrous ammonia.

in this area is plowed in by tractor, and at present we have four tractors in service. In order to deliver the ammonia to these tractors two 1000-gal. trailers are usually required for each tractor in order that we may go to the farm with a full trailer and pick up the farmer's empty for refilling without shutting down the tractor operation. As most of the ammonia is applied in about a six-week period, it is necessary to keep the tractors in operation from daylight to dark.

When the farmer is applying ammonia in irrigation water it is necessary, of course, to have one tank for each application, plus additional trailers to take out as the one in service becomes empty. All our equipment is loaned to the farmers except the tractor applicators and pull-rig applicators, which are rented on an acreage basis. For this reason all our farm-use tanks are trailer mounted.

How Much Money?

The capital required depends almost entirely upon the amount of possible business in the area, but in any case I would think that \$50,000 would be a minimum to have available, even though that amount probably would not be used at the very start. One tractor in pre-plant season can cover about 80 acres per day by working on a 24-hour basis. During the sidedress season on row crops it is almost impossible to work at night, so an average of 30 to 40 acres per day is all that one tractor can cover.

These daily maximums will, along with the possible sales totals, determine the number of tractors needed for the business. In other areas the

amounts will vary with the type of crop, but these should be fairly close in any row crop area. Also, the time for sidedress operations is short, especially in cotton, as the plants soon become so large that the tractor will damage the crop.

We have a contract for ammonia that gives us an assured supply, and this is one thing that I believe is an absolute necessity. The on-off-season quotas require a reputable and certain source of supply, and these types of supply sources are not interested in adding a dealer unless his storage facilities are adequate to allow him to make his purchases of ammonia fairly evenly over the 12 months, even though most of his sales come during only a very few months of the year.

The ammonia sales in our area are at their peak during our slack season, but in irrigation areas where LPG is used for pumping fuel, the peak comes during the busiest season. In either case, the ammonia business, in my opinion, still requires its own employees for at least the first few years. The ammonia business is not a sideline for the average LPG dealer.

In dollar volume during the application season, ammonia comes in ahead of LPG. During the rest of the year the ammonia department has considerable expense but no income at all. As an extra business for the LPG dealer in the farming areas, I believe that ammonia certainly has its place. The ammonia operation does require a large capital investment, and in a row crop area the application season is so short that equipment purchased must remain idle during many months of the year.

In our area, with only about 35,000

acres of potential crop fertilization, the ammonia business would not be profitable as an individual operation. In other areas with much larger cultivated acres there would be a profitable operation in ammonia alone.

All ammonia equipment is marked plainly with anhydrous ammonia signs and is painted white. What similar tanks are in use with LPG are painted aluminum, and carry the signs "Butane-Propane."

Some equipment is converted from one service to the other, but each piece is steamed and refitted first. No tanks are used in LPG service with steel fittings, just as no tanks are used in AA service with brass fittings.

Volume Necessary

The ammonia business is, in short, a very good line to fit in with the LPG operations of a dealer who has sufficient capital to make a large investment, or sufficient borrowing power for long term loans for this investment. The business does not pay out too rapidly, and as a large volume is vitally necessary to create a very profitable operation, a dealer must be prepared to lose money for a year or two in any new area.

In an area already using large quantities of ammonia the need is in getting enough good personnel to go out and get a fair share of the available business, which again would probably create a loss for the ammonia department during the first years of operation. I would say that the average dealer should have assurance that his sales would come to at least 300 tons per year before even considering entering the field.

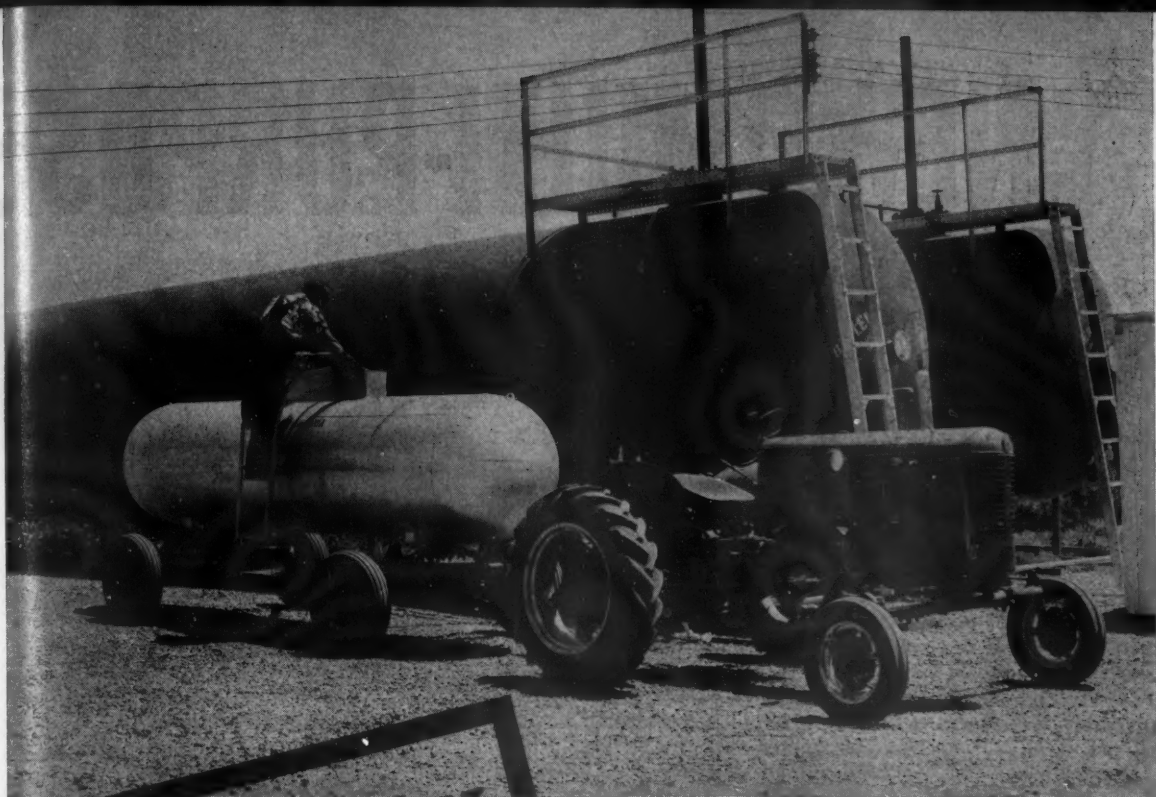


Photo courtesy of J. I. Case Co. Inc.

New storage in the Illinois corn country. Farmer's trailer tank on substantial chassis provides convenience and safety.

SAFETY

By Carl Abell
Editor

... in Handling Anhydrous Ammonia

IN the safe storage, transportation and handling of anhydrous ammonia there are many similarities to L. P. gas, but there are also several important differences. Let us consider first the similarities, which lead to the close resemblance in the storage and transportation facilities and methods of handling the two products.

Anhydrous ammonia is, like LPG, a gas at normal atmospheric temperatures. It is readily liquefied by processes incorporating compression and cooling, so it is ordinarily stored and transported in liquid form, being allowed to return to the vapor state for most agricultural and industrial applications. Its boiling point is -28°F and, like LPG, its vapor pressure goes up as the temperature rises, along a curve quite similar to that of the petroleum gases.

Unlike LPG, vaporized AA is light-

er than air; it tends to rise instead of settling in the low places. AA is flammable, but only within the limits of 16% to 25% mixtures by volume with air. It is more difficult to ignite than LPG, hence from the standpoint of fire and explosion it is a safer product to handle. Shipments in portable containers are handled under the ICC green label, which indicates that it is a dangerous product but not particularly hazardous as a combustible. Some of the important physical comparisons between AA and the common L. P. gases are given in Table 1.

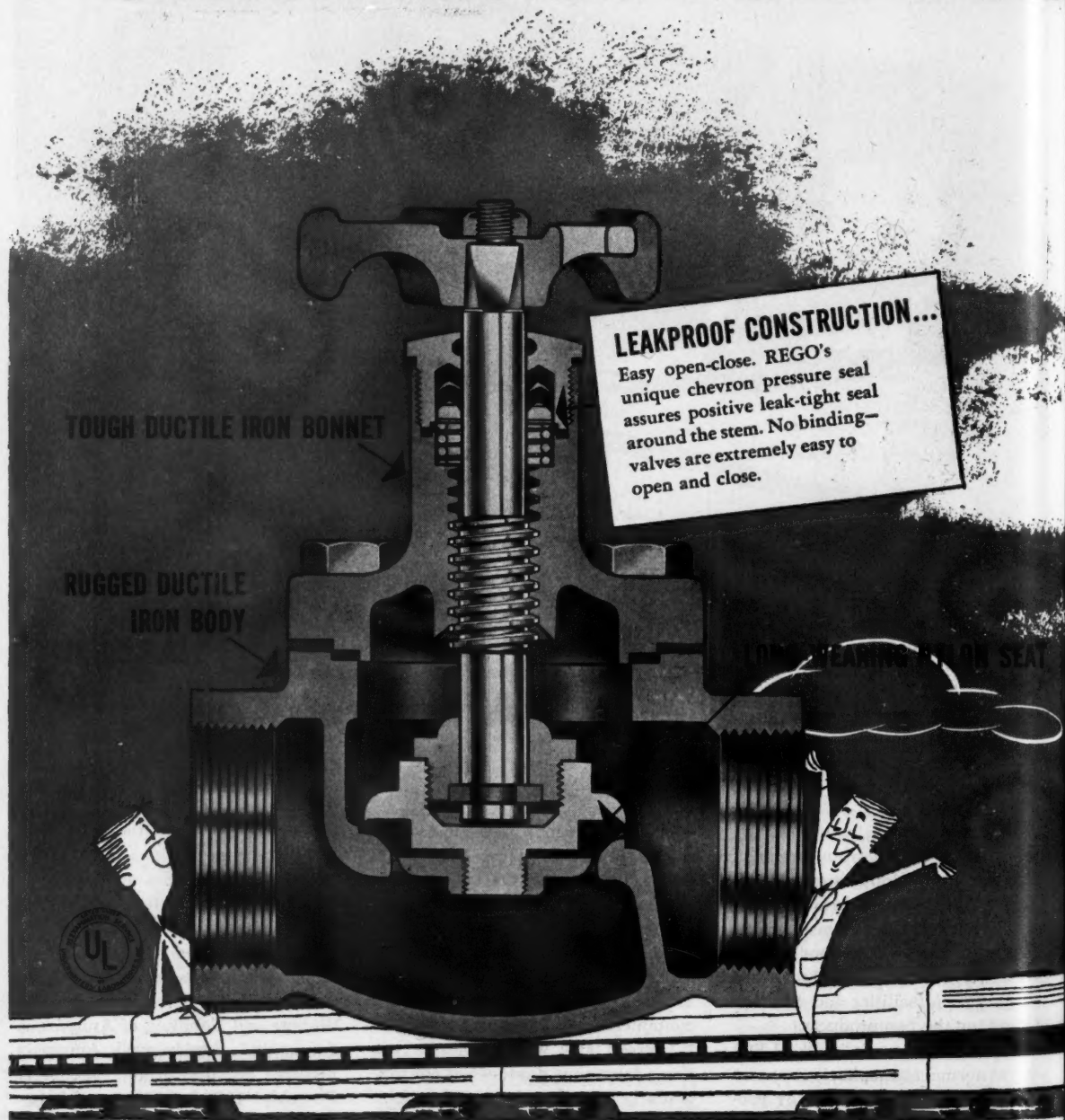
The characteristics of the storage and transportation equipment for the two products are very similar in appearance, structural requirements, and methods of operation. The same general design is followed, and the requirements for strength and factors of safety with AA equipment

practically duplicate those for propane. The same portions of the ASME and API-ASME codes are quoted to govern the manufacture and testing of the containers.

The accepted standards for the AA industry are contained in the following pamphlets: "Standards For the Storage and Handling of Anhydrous Ammonia," Agricultural Ammonia Institute, Memphis, Tenn. (50 cents); Pamphlet G-2, 3rd Edition, "Anhydrous Ammonia," Compressed Gas Association Inc., New York, N. Y.; and Chemical Safety Data Sheet SD-8, "Anhydrous Ammonia," Manufacturing Chemists Association of the United States, 608 Woodward Bldg., Washington 5, D. C. Certain data is duplicated in all three publications.

It is recommended that any LPG distributor who is now handling, or plans to handle AA should obtain and

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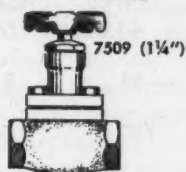
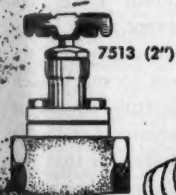
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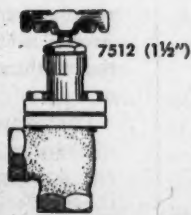
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become thoroughly familiar with the contents of the first pamphlet listed above, as an essential guide in the safe design and use of the storage and transportation equipment used in handling the product. At least one of the other publications should be obtained and used as source material in training employees in the necessary procedure of avoiding personal hazards in connection with the product, and in caring for personnel who have been exposed to AA fumes.

Eliminate Contamination

As in the case with LPG, the various state codes relating to AA storage and transportation equipment differ in certain details, so the applicable state code should also be obtained and followed. An outstanding example of these local differences ap-

pears in the California Industrial Safety Department's safety orders, which require a working pressure of 265 psi minimum in all equipment used with AA, whereas the industry standards and most other states accept pressure vessels with working pressure of 250 psi under the API-ASME code, and 200 psi under the 1952 edition of the unfired pressure vessel code of the ASME.

The reason for the special requirement of the California department is its desire to eliminate possible hazard of contamination of LPG with ammonia, which might be incurred if propane equipment were used for seasonal storage and transportation of AA. Such contamination of domestic fuel could result in highly undesirable products of combustion in unvented appliances such as kitchen ranges.

This emphasizes the importance of complete cleaning and decontamination of any equipment used intermittently for handling LPG, and AA, when changing from one product to the other, and provides one of the important reasons back of the recommendation against the alternate use of LPG equipment in AA service.

No Brass and Copper

All of the codes emphasize another point of utmost importance—that no valves, fittings, or other components used in AA systems shall be made of brass, bronze, or copper. This is because of the chemical action of ammonia which leads to the quick disintegration of these non-ferrous metals. The materials specified for all components of AA containers are iron, steel, and stainless steel. Special ammonia valves, fittings, gauges, pumps and compressors made of these materials are available for use with AA.

Since not all units made of these materials are designed with the strength factors required to hold the pressures encountered, it is important that the correct units be installed. In the case of valves and fittings, it is customary to mark each unit with the manufacturer's name or trademark, catalog number, and code designation which indicates that the unit is suitable for anhydrous ammonia service. Such a designation on a pressure relief valve might be "AA-250-4050 (air)," which means that this valve is suitable for use with anhydrous ammonia, that it is set to discharge at 250 psi, and that its rate of discharge is 4050 cu ft per minute of air.

No Compromise

There should be no compromise in selecting these units to be included in the AA system. Only the products of reliable manufacturers, properly approved and marked, should be accepted. The materials used in these valves and fittings are more difficult to manufacture than the brass and bronze used in propane systems, so the purchase price is necessarily higher.

Pumps and compressors for ammonia service differ only slightly from the corresponding LPG units, but these differences are most important.

TABLE I

Comparative Characteristics of Anhydrous Ammonia, Propane, and Butane

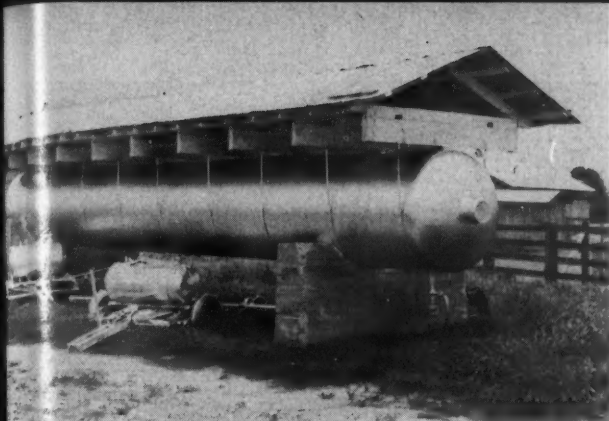
	Ammonia NH ₃	Propane C ₃ H ₈	Butane C ₄ H ₁₀
Molecular symbol	NH ₃	C ₃ H ₈	C ₄ H ₁₀
Molecular weight	17.032	44.09	58.12
Boiling point, degrees F, at one atmosphere	-28	-44	31
Latent heat at BP and one atmosphere, Btu/lb	589.3	183	166
Specific gravity of liquid at 60° F (Water 1) .....	.6819	.508	.584
Specific gravity of gas at 60° F (Air 1) .....	.58	1.52	2.01
Weight per gal. at 60° F, lb	5.14	4.23	4.86
Limits of combustion, degrees	16 to 25	2.0 to 9.5	1.5 to 8.5
Ignition temperature, degrees F	1204	950	890

TABLE II

Physiological Response to Various Concentrations of Ammonia*

	Parts of NH ₃ per million parts of air (by volume)
Least detectable odor	53
Maximum concentration allowable for prolonged exposure	85-100
Maximum concentration allowable for short exposure (½ to 1 hour)	300-500
Least amount causing immediate throat irritation	408
Least amount causing immediate eye irritation	698
Least amount causing coughing	1720
Dangerous for even short exposure (½ hour)	2500-6500
Rapidly fatal for short exposure	5000-10000

* "Noxious Gases," Second Edition—American Chemical Society Monograph No. 35—Henderson & Haggard.



Many of the plantations in northern Mississippi have large storage, shaded to prevent pop-offs.



Many large-capacity spheres are used for AA storage in the deep south.

Again, the AA transfer units will work with LPG, but such equipment purchased for LPG service should not be used with ammonia without first ascertaining from the manufacturer that the design and materials are suitable for that service.

Plant Construction

While the basic principles of design and construction of plants for both products are the same, the chemical differences in the products impose certain special requirements. To give a general idea of these variations, the requirements are highlighted in the following paragraphs. It should be understood that this discussion is not complete in detail and that actual construction of plants should only be undertaken by persons thoroughly familiar with all phases of the code requirements of both industry and authorities having jurisdiction.

The code requirements for the fabrication, testing, and marking of the containers are the same in both instances, with the exception of such state and local regulations as may apply. The materials for the valves and fittings have already been mentioned. Filling densities are given by a different table because of the different weight and characteristics of the product. While the end result is nearly the same, the ammonia tables are used in designing the liquid level gauges and in calibrating the rotary and float type gauges. This is taken care of by the fabricators of the tanks and the gauge manufacturers, and need not concern the purchaser.

Painting of storage containers comes in for special consideration. The Agricultural Ammonia Institute

standards (2.13.1) say, "White is the recommended color for all above-ground containers, with other light reflecting colors accepted."

The AAI code also specifies that no unrefrigerated container shall exceed 30,000-gal. capacity. In areas having high summer temperatures, it is customary to provide protection from the direct heat of the sun by building a roof with a wide overhang above the tank. This is merely an overhead shelter, open on all four sides.

Refrigerated tanks of larger capacity are used in many installations. In order to hold down the cost of refrigeration, these tanks are customarily insulated with some form of fireproof material. Since these large size installations present problems that are beyond the experience of the average LPG operator, we merely mention that they are permissible. No such construction should be undertaken without the services of a competent engineer familiar with all phases of ammonia plant installation.

Special regulations apply to the location of storage tanks. Quoting from the AAI Standards (2.4), "Permanent storage shall be located outside of densely populated areas and subject to the approval of the authority having jurisdiction. However, this distance shall not be less than 50 ft from the line of property that may be built upon, or from a source of drinking water, and not less than 400 ft from any school, hospital, or other place of public assembly."

Piping specifications differ only slightly from those for L. P. gas. Use of galvanized piping is prohibited, as are any cast iron fittings, even pipe plugs. Schedule 40 steel pipe may be used with welded and flanged fittings,

but any pipe on which screwed joints are used must be the Schedule 80 specification, and the joints must be put together with a compound resistant to ammonia. Litharge and glycerine compounds are satisfactory. Some which do nicely with LPG do not qualify, as they are attacked by ammonia.

All hose of ½-in. inside diameter or larger must be clearly marked to give the following information: "For Anhydrous Ammonia. Bursting Pressure—." The manufacturer's name or trademark and the year of manufacture must be included on the label, which should appear at intervals of not more than 5 ft. Bursting pressure specifications parallel those for LPG in the corresponding situations.

Transport Design

Regulations covering the design of transports and bulk trucks differ only slightly from those for LPG except for the requirement for suitable materials in the construction of the valves, fittings, and transfer units. The major difference is that all containers more than 5½ ft in length should be equipped with internal baffle plates. This is sound engineering practice, and could be advantageously adopted for LPG transportation tanks. The AAI standards call for signs on both sides and the rear, with COMPRESSED GAS in letters at least 4-in. high, and ANHYDROUS AMMONIA in letters at least 2-in. high.

Farm vehicles equipped with bulk tanks, and of less than 1200-gal. capacity must comply with the same basic specifications as distributors' transportation equipment except for minor details, none of which affect the



Domestic LPG tank with ammonia valves and fittings used for field supply tank on Yazoo Delta.



Rubber gloves should be worn during all transfers of AA, whether at bulk plant or in the field.

Photo courtesy of J. I. Case Co. Inc.

working pressure requirements for personal safety equipment that must be carried on the distributors' and transporters' vehicles.

All transportation equipment, regardless of where used, having capacity of 250 gal. or more, must be equipped with a pressure gauge reading from 0-400 psi. Similarly, all such containers having more than 250-gal. capacity must be equipped with vapor return valves to permit filling without venting ammonia to atmosphere to assist in the transfer. On field application equipment with tank capacity of less than 250 gal., both of these requirements are omitted, and the AAI standards specifically state that pressure may be bled to atmosphere as an aid in filling the tanks.

While AA presents only a moderate hazard of fire or explosion, its characteristics are such that exposure to even limited concentrations is damaging to human health. The publications of the various organizations in the industry give the information in Table 2 in regard to exposure to ammonia vapor. Because of these personal physical hazards certain protective equipment is required, both at bulk storage plants and on motorized equipment used regularly in the transportation of AA.

Concentrated Vapor

As indicated in Table 2, concentrated fumes are damaging to the skin, to all mucous membranes, and to the eyes. In addition, impingement of a jet of escaping 'AA' vapor, like LPG, will produce a serious freezing effect. The required protective clothing at storage plants includes rubber boots and gloves, rubber slicker or jacket and pants, an approved type

gas mask (green canister) with refill cartridges, and tight fitting ventless goggles. Auxiliary protective equipment includes a first aid kit (ammonia type), a fire extinguisher, and an easily accessible shower bath and/or one 50-gal. open top drum filled with water. The required personal safety equipment for transportation vehicles omits the rubber boots and body clothing, and reduces the water requirements to 5 gal.; otherwise the safety equipment is the same.

Leaks in AA equipment are readily detectable by odor. Most normal persons can detect ammonia in concentrations down to approximately 50 parts per million in air. Because of the personal hazard, all leaks should be taken care of at once. The person attempting to locate the leak should wear adequate protective clothing, including a wide brimmed felt, rubber or treated fiber hat. Where the leak is small and the exposure will be only for a matter of a few minutes, the canister type mask will be adequate, but for more serious exposures an "air-line" respiratory system should be used. These may be obtained for emergency use from fire departments or petroleum refineries. The supply of air for this system should stay out of the affected area.

In attempting to locate minor leaks a sulfur taper, a moistened piece of phenolphthalein paper, or an open bottle of hydrochloric acid may be used as indicators. When ammonia vapor comes in contact with the sulfur dioxide from the burning sulfur stick, or with the fumes of the hydrochloric acid, a dense white fog is produced. The phenolphthalein paper turns red in the presence of concentrated ammonia. In cases where there is any danger that the concentration

of ammonia may reach the explosive range (between 16% and 25% by volume) it is advisable not to use the burning sulfur.

When a leak is serious and can not be stopped in a very short time, it is advisable to play a stream of cold water directly on the leak. The escaping ammonia will be largely absorbed by the water, thereby reducing the hazards of explosion and of injury.

Safety Precautions

No employee should be permitted to work in an ammonia storage area, nor on AA transportation equipment, without first being carefully instructed regarding the hazards of the product, and in the use of the protective equipment and the recommended first aid procedure to be followed in case of exposure. This information is available in the pamphlets mentioned and in special information that may be obtained from Agricultural Ammonia Institute. A particularly clear and understandable discussion of this important phase of ammonia handling is contained in a booklet entitled "Ammonia—Its Uses and Properties," published by Commercial Solvents Corp., 260 Madison Ave., New York 16, N. Y.

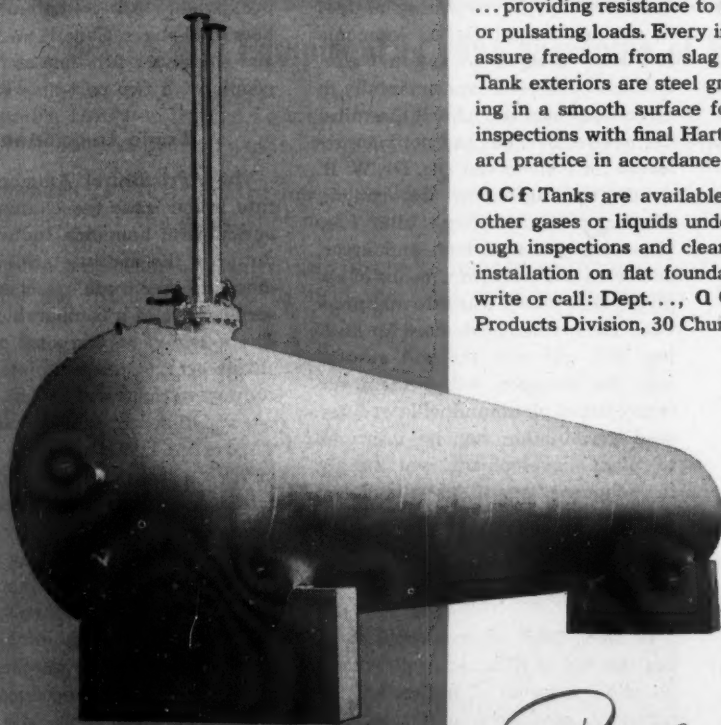
Employees with a good basic knowledge of safety as applied to the handling of L. P. gas already have a good foundation for training as handlers of anhydrous ammonia. The additional information that they need to prevent the hazards of personal exposure can be quickly acquired. This knowledge should be mastered before any exposure is permitted, and as is the case in handling L. P. gas, it should be frequently reviewed for the establishment of safety.

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By Jack F. Criswell
Agricultural Ammonia Institute
Memphis

AAI Plays Vital Part In Ammonia Industry

Founded in response to the rapid growth in the use of NH_3 , the Agricultural Ammonia Institute encourages agriculture, provides information, and promotes safe practices in the use of AA.

FROM a beginning of 20,000 tons of contained nitrogen in 1946-47 to 333,000 in 1953-54 is the story of anhydrous ammonia's use and growth as a nitrogeous fertilizer. Phenomenal, yes, but believed by many to be only the beginning.

So far, anhydrous ammonia as a commercial nitrogen fertilizer has proved successful in all humid areas where it has been used in direct application to the soil. It has also proved competitive and in most instances the most economical source of agricultural nitrogen.

Qualities and Advantages

Anhydrous ammonia (NH_3) is 82% nitrogen. It is a liquid under pressure and a gas when released. Being lighter than air it must be released (to be contained) in the presence of moisture; otherwise, evaporation returns it to the air as nitrogen and hydrogen. It has a strong affinity for water; thus, soil moisture held in undersurface clay particles and humus makes an ideal area for releasing the nitrogen gas.

The 4-to-6-in. depth required for holding ammonia also places it beneath the germination area for most grass and weed seed. This gives the planted crop a "running start" on competitive foreign growths. In the ammonia form the nitrogen does not leach nor move with soil moisture.

One further advantage of nitrogen in the ammonia form is that certain young plants, notably cotton and corn during the first two weeks of life, cannot utilize nitrogen in the nitrate form, but can take on nitrogen in the

ammonia form. With ammonia nitrifying in 10 to 20 days under normal growing conditions, there is a distinct advantage in growing off both of these crops rapidly.

Anhydrous ammonia had its first widespread use for direct application, commercially, in the spring of 1947 in the Mississippi Delta. Ammonia had been used in irrigation water, and had been used experimentally in direct application by Shell Chemical Co. before 1947, but had not been released for commercial use. Dr. W. B. Andrews, agronomy department, Mississippi state college, after four strenuous years of trial and error, perfected and released a means of applying NH_3 which was safe and practical. The method he devised for knifing NH_3 gas into the soil assures that the nitrogen will remain for future use of plants and will not deter seed germination nor be injurious to plant development, yet supply in adequate quantities the large amounts of nitrogen needed for maximum yields.

Institute Organized

In Dec., 1950, after a rapid four-year spread of NH_3 use in direct application, a group of interested distributors, producers, and accessory manufacturers met in Memphis and organized a national trade association, the Agricultural Ammonia Institute. In Jan., 1951, with by-laws and a charter granted under the laws of the state of Tennessee, the institute began operations.

Voluntary memberships were invited and assessments were made on

a tonnage basis for distributors, with producers and manufacturers paying a fixed annual fee. As growth and experience were gained, membership assessments were changed for all classifications to a volume-of-business basis. Today the institute has approximately 300 contributing members in 41 states, Canada and Mexico, and employs a full-time staff of four people with two part-time employees.

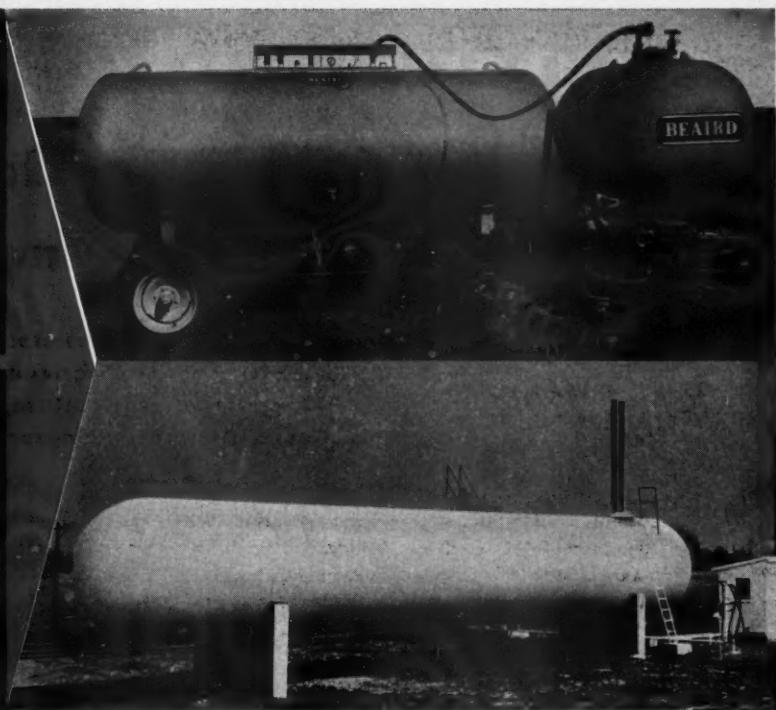
Trade Association

The Agricultural Ammonia Institute is the trade association for the agricultural ammonia industry. The duties of the institute are similar to those of other trade associations and services are of a comparable nature. The four general purposes of the institute are: (1) to stimulate and encourage agriculture; (2) to accumulate and disseminate information; (3) to advance knowledge and learning in the sciences; and (4) to encourage safety, efficiency and standardization.

To work toward the accomplishment of these purposes, the institute attempts always to keep in mind the general welfare of agriculture. The farmer must be both informed and prosperous if he is to purchase nitrogen to increase crop production. The distributor must appreciate the importance of balanced fertilization as well as nitrogen needs before continuing successful results can be expected. The producer and manufacturer must appreciate the application and ultimate end use of their product at the farm level before longtime, steady growth and expansion can be expected for their product. Thus, all phases

...on the
FARM
or

...at the
PLANT



Beaird NH₃ Equipment is your guarantee of Finest quality!

Maximum Safety — Beaird anhydrous ammonia equipment is backed by the combined research, engineering, inspection and testing facilities of the five great Beaird manufacturing divisions.

Dependable Service — Beaird has over 36 years of experience in building pressure storage equipment for the petroleum and chemical industries.

Durable Construction — Beaird anhydrous ammonia equipment is fabricated from top quality materials and fully tested to meet the most exacting standards.

BEAIRD, a pioneer manufacturer in the anhydrous ammonia industry, is the first to develop a complete line of storage and handling equipment—from 110 gallon applicator tanks through 30,000 gallon bulk storage plants.

Ask your local Beaird representative for new literature on Beaird Anhydrous Ammonia equipment or write to us direct.

THE J. B. BEAIRD COMPANY, INC.

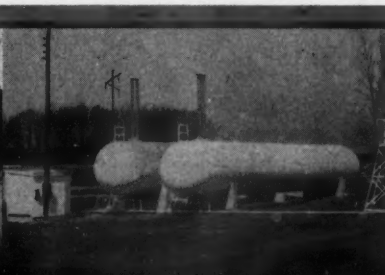
SHREVEPORT, LOUISIANA • STOCKTON, CALIFORNIA

BEAIRD

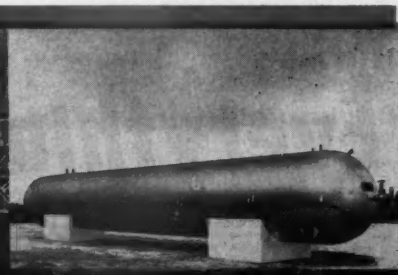
LP-GAS SYSTEMS • PACKAGED COMPRESSOR PLANTS • CAST STEEL FITTINGS • ANHYDROUS AMMONIA EQUIPMENT



TRANSPORTS — 5380-gallon twin tank model designed for maximum payload, safety and rugged service.



PACKAGED BULK STORAGE PLANTS — 4,000, 8,000, 12,000, 15,000, 18,000 and 30,000 gallon capacities. Available as a single tank or as a complete plant on turn-key or install-it-yourself basis.



PONTOON BULK STORAGE PLANTS — 3,000, 4,000, 6,000, 8,000, 12,000 and 15,000 gallon capacities.

HOWE AMMONIA GAS TRANSFER COMPRESSORS

MODEL AA-2355
with 5 HP MOTOR



Only HOWE Gives You All
These Compressor Features!

- Discharge valves in head with SAFETY FEATURE —no suction tank necessary.
- Suction scale trap.
- High pressure safety relief valve.
- Oil charging and oil drain valve.
- Automatic crankshaft seal.
- 4-way transfer valve.
- 3 1/2" pressure gauges with shut-off valves.

Write for Literature

- Forty-two years experience in building Ammonia Compressors.
- Ammonia gas cooled cylinders (Patent pending).
- Double trunk type pistons — reducing oil pumping to a minimum and making oil separator unnecessary.
- Ring plate valves.
- Suction valve in piston head.



MODEL AA-2355G
7 HP GAS ENGINE with Clutch

**Buy Direct
from
Manufacturer!**

All Models in Stock For
Immediate Shipment

HOWE ICE MACHINE CO.

2815 MONTROSE AVE., CHICAGO 18, ILL.

Cable Address: Himco, Chicago

**Everything
in the Ammonia Field**

**Bulk Storage
Application Equipment
Accessories**



GOTCHER
ENGINEERING AND
MANUFACTURING CO.
CLARKSDALE, MISSISSIPPI

of manufacturing and servicing with-
in the anhydrous ammonia industry
must work for the common good.

The institute has among its mem-
bership three principal categories—
ammonia distributors, ammonia
manufacturers and manufacturers of
accessory equipment. Each member
is kept informed of industry develop-
ments through *Agricultural Ammo-
nia News* (a quarterly publication),
newsletters and releases.

They are provided with "Stand-
ards for the Safe Storing and Hand-
ling of Anhydrous Ammonia"; fre-
quent technical bulletins; a buyers'
guide; special promotional material,
such as fall application bulletins dis-
tributed the past two years.

The institute sponsors one summer
educational conference, assists in re-
gional and state conferences, and
plans and executes an annual con-
vention and trade show for the bene-
fit of AAI members and the industry.
Indication of increased interest in the
industry is seen in attendance figures
for annual AAI conventions. The con-
vention in 1952 attracted 360 people.
In 1953, 853 were registered, and in-
dications are that over 1000 people
will attend the 1954 three-day pro-
gram and trade show in New Orleans,
Dec. 6-8.

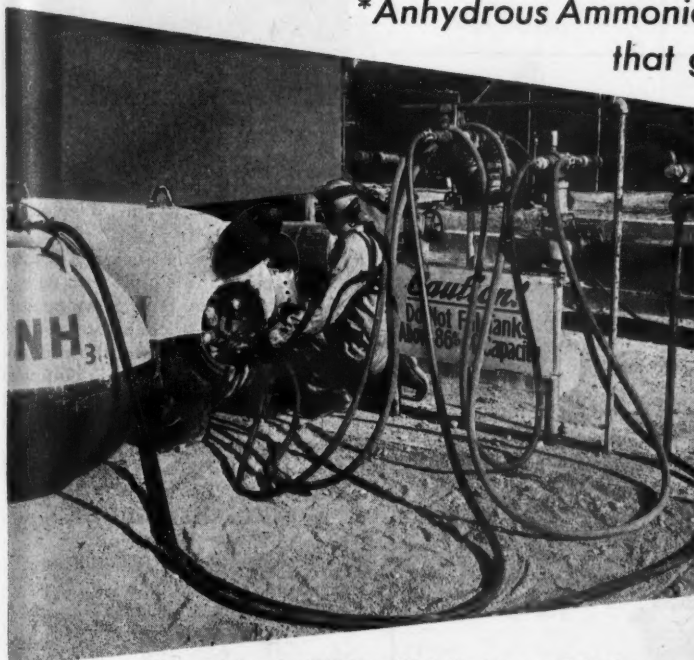
Institute Programs

The institute operates its program
projects primarily through commit-
tees. This allows, at all times, quali-
fied personnel to contribute to find-
ings or special recommendations un-
dertaken or endorsed by the institute.
Noteworthy among some of the pro-
jects now underway are: (1) lower-
ing liability insurance rates, (2) pro-
motion of safety measures, (3) estab-
lishing standards for equipment, (4)
depreciation rates on storage facili-
ties, (5) model laws for legislative
guidance, and (6) research as related
to agronomic problems.

The institute, now in its fourth
year, has become an integral part of
the anhydrous ammonia industry,
and has taken its place among other
trade associations. We believe the vi-
sion of the original 29 members who
organized the institute is being real-
ized, and that their fondest hopes will
be exceeded through membership,
industry support, and the continued
cooperation of kindred associations.

SAFE, blister-free hose for handling NH_3 *

**Anhydrous Ammonia...the source of soil nitrogen
that greatly increases crop yields*



More and more LP Gas distributors and dealers are handling anhydrous ammonia (NH_3) used by progressive farmers to put nitrogen in the soil.

For the safe transfer of NH_3 from your tanks to the tanks of your customers be sure you get the blister-free hose with patented anchor braid construction—Gates 73B-HB Hose in all larger sizes.

Built for working pressures up to 350 psi

Minimum burst pressure is 1750 psi and working pressure provides a 5 to 1 safety factor.

Meets industry specifications

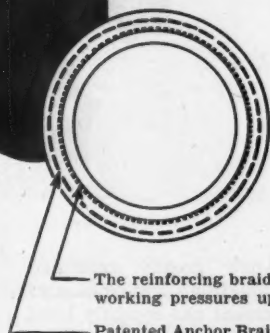
Gates Anhydrous Ammonia Hose meets the joint specification of the Agricultural Ammonia Institute, and the Rubber Manufacturers Association.

Available everywhere There is a Gates Industrial Hose distributor in every major marketing center. Call him for prompt delivery of the hose you need. The Gates Rubber Co., Denver, Colorado.

**Patented
Anchor Braid
construction
assures
long life and
SAFETY**



The Mark of
Specialized Research



The reinforcing braids safely handle working pressures up to 350 psi.

Patented Anchor Braid—imbedded in cover layer prevents accumulation of gas and blisters.

The larger sizes used by bulk plant operators and distributors are made with patented anchor braid construction (U. S. Patent No. 2652093)—a special braid imbedded in the cover in addition to the reinforcing braided cords inside. The anchor braid prevents accumulation of gas under the cover.

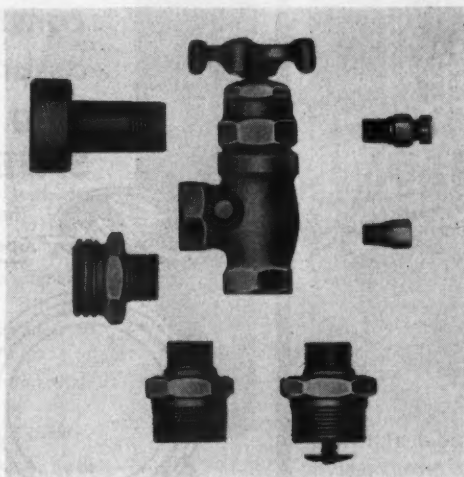
TPA-21

GATES Anhydrous Ammonia HOSE

New Products and Trade Publications

To secure further information on these anhydrous ammonia products, fill out the coupon and mail, indicating by number the items desired.

1. Multi-Port Valve



An all-new greatly expanded line of anhydrous ammonia control equipment has recently been introduced by the Bastian-Blessing Co., manufacturer of valves and fittings for high pressure gases. Specifically designed and engineered for NH_3 service, this new line is the culmination of exhaustive testing plus a comprehensive field study to determine the exact needs of the ammonia industry.

One of the principal items of the new line is its A7506 series "Multivalve" assemblies, designed for use on field storage tanks and applicator tanks. Comprising a basic angle valve, plus optional auxiliary fittings, the versatility of these assemblies provides 27 different applications to meet the varying needs of all who use NH_3 . Some of these applications in-

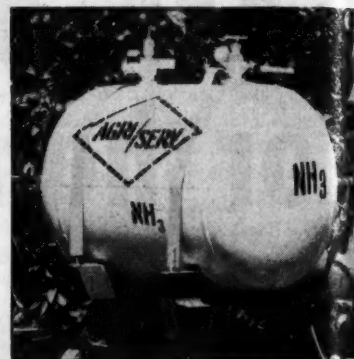
clude: positive shutoff filler valve; positive shutoff liquid withdrawal valve; combination filler and liquid withdrawal valve; positive shutoff vapor return valve; and filling hose shutoff valve.

Also of high importance in the new line is a series of ductile iron globe and angle valves, in sizes from $\frac{3}{4}$ in. to 2 in., for use on field storage tanks, truck tanks and bulk storage tanks. The positive-leak-proof construction of these valves is claimed to be due to their exclusive Teflon chevron pressure seal.

Other items in the NH_3 line include liquid withdrawal, filler, vapor return, excess flow, check, relief and bleeder valves, as well as adapters and liquid level gauges.

The Bastian-Blessing Co.

2. Applicator Tank



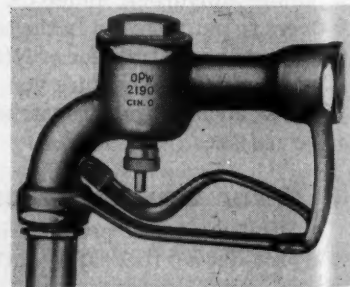
The NH_3 applicator tank shown here is one of the many tanks supplied to agricultural ammonia service by Buehler Tank & Welding Works.

The tank on this tractor is 110-gal. gross capacity. It is built with no legs and no base. The tank is strapped to the tractor by a couple of saddles which are built on top of the applicator implement. The tank is equipped with steel valves especially designed for anhydrous ammonia and, in this case, uses no fitting guard. However, the tanks are available with guards if so desired.

All Buehler tanks are made to conform to 250- or 265-lb working pressure ASME code or to the ICC specification number MC-330.

Buehler Tank & Welding Works

3. Dispensing Nozzle



This nozzle is constructed of hite-n-sile aluminum alloy, including body, cap, tube, and disc holders. Lever pin, stem and main spring are of stainless steel. Disc material for both upper and lower discs is of Teflon. Protective raised lugs on body of nozzle resist wear. Heel of guard has three-speed, hold-open notches. Nozzle is tapped standard pipe thread on inlet and outlet ends.

The No. 2190 nozzle is especially designed and recommended for anhydrous ammonia, liquid nitrogen and acetic acid, and may also be used to

"PREST-O-LITE"

Trade-Mark

CYLINDERS FOR ANHYDROUS AMMONIA give you all these

advantages



- * Rugged, Sturdy, Construction
- * Light Weight—
Lower Handling Cost
- * Maximum Safety—
All Code Requirements
Surpassed
- * Long Service Life—
Minimum Maintenance
Costs

SPECIFICATIONS

Style	Dimensions			Capacity		Weight
	Diameter, I. D. in.	Length in.	Base O. D. in.	Gas lb.	Water cu. in.	lb.
AA-50	11 $\frac{3}{4}$	32 $\frac{1}{2}$	12	50	2588	58
AA-100	14 $\frac{3}{4}$	39 $\frac{3}{4}$	13 $\frac{3}{4}$	100	5169	103
AA-150	14 $\frac{3}{4}$	54 $\frac{3}{4}$	13 $\frac{3}{4}$	150	7726	144 $\frac{1}{2}$

Precise Construction—PREST-O-LITE cylinders are produced by deep drawing to exact and *uniform* wall thickness throughout.

Light Weight—Made of high-strength alloy steel, cylinders are light and easy to handle; thus they keep shipping and storage costs down.

Easy Identification—Code and serial numbers are large and distinctly impressed and remain legible even after repeated paintings.

Corrosion Minimized—Smooth, even welds leave no pockets to collect dirt or moisture. Ventilating and drainage holes in the foot ring prevent sweating, trapped moisture


and corrosion under the base of the cylinder.

Extra Protection and Service—All cylinders are subjected to manufacturing tests and inspections that are far more strict than the standard tests required to meet I.C.C. Specifications 4AA-480.

Plus values like these are standard with all PREST-O-LITE cylinders, made by LINDE, the world's largest manufacturer and user of compressed gas containers. A full half century's experience is passed on to you with every cylinder you get. PREST-O-LITE cylinders are your wisest, most economical investment. Write, or 'phone your nearest LINDE office today for complete information.

Linde Air Products Company

A Division of Union Carbide and Carbon Corporation

30 East 42nd Street,  New York 17, N. Y.

Offices in Other Principal Cities

In Canada: DOMINION OXYGEN COMPANY

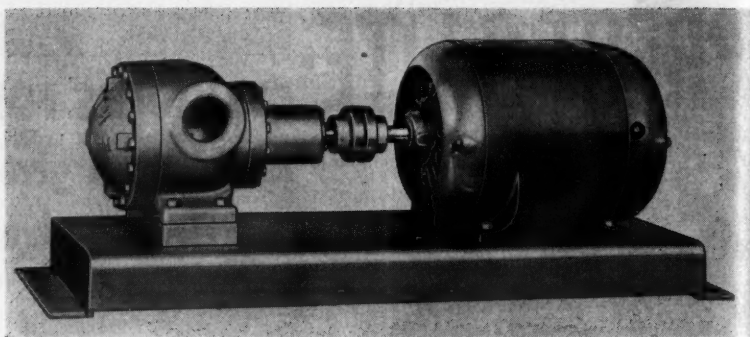
Division of Union Carbide Canada Limited, Toronto



"Linde" and "Prest-O-Life" are registered trade-marks of Union Carbide and Carbon Corporation

dispense other chemicals that do not affect and are unaffected by aluminum or stainless steel. It has a sensitive valving mechanism to insure a well controlled, fast, sure delivery of product.

According to the manufacturer, this is a dispensing nozzle that provides full flow, shockless closure and the added protection of a nozzle specifically engineered for handling hazardous liquids. It is precision made for maximum efficiency. Size: 1½ in. O P W Corp.



4. Pumps For AA Service

Smith Precision Products Co. announces that all models of Smith Precision pumps, except TC-1044, are now available fitted for anhydrous ammonia service. However, prospective users are warned to be sure to specify on orders that pumps are to be used in anhydrous ammonia service, as otherwise standard propane pumps will be sent.

All copper or copper-alloy parts in Smith Precision standard pumps, such as brass and bearing bronze, must be replaced with other materials giving equal performance without the copper for ammonia use. Certain synthetic parts in the mechanical shaft seal (self-adjusting packing) must also be changed. A pump fitted for propane should never be used in anhydrous ammonia service, as excessive wear and shaft leak trouble will result.

Anhydrous ammonia is slightly more difficult to pump than propane, but it is easier to handle than liquid carbon-dioxide, to which service Smith Precision pumps have also been successfully adapted. As with propane, pumping installations are carefully engineered. Pumps are provided with a flooded suction, and differential pressure is limited to 40-50 psi above tank pressure for longest pump life. Consultation on pump installation problems is available to prospective users without cost.

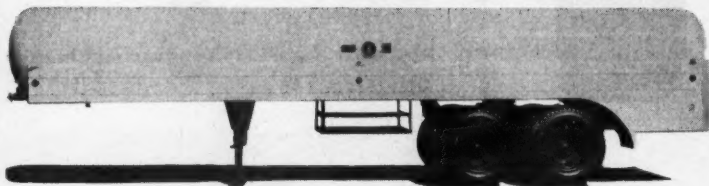
LPG distributors having propane pumps that are out of service may have them converted for ammonia at the factory for a nominal charge. Such pumps are then not suitable for propane unless they are re-converted later on.

Smith Precision Products Co.

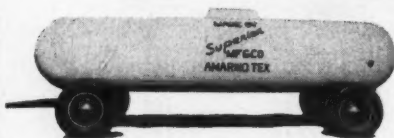
5. Applicator

Strength and light weight are some of the features of the anhydrous ammonia applicator made by Pollard Manufacturing Co. This piece of equipment is the result of wide re-

SUPERIOR MAKES ANHYDROUS AMMONIA TRANSPORT AND SERVICE EQUIPMENT THAT'S SAFER, SERVES BETTER, LASTS LONGER



AMMONIA TRANSPORT — 5500 W. G. Capacity



FARM SERVICE TANK
1000 Gal. Capacity



APPLICATOR TANK
110 Gal. Capacity

Anhydrous ammonia equipment by Superior owes its high quality to the experience we've gained in fabricating complete fractionating equipment for the plants that make anhydrous ammonia and LPG. Our experience has told us what you and your customers want. All your demands become reality in Superior vessels.

You get more of the features that pay off when you buy ammonia equipment by Superior. Long life and usefulness . . . capacity where capacity is needed . . . maximum safety (265 p.s.i. working pressure in most vessels) . . . maximum unloading rates—all are features that help insure profitable operation.

You name it. Superior makes it—and makes it better!

PIONEERS
IN THE
MANUFACTURE
OF LPG
AND
ANHYDROUS
AMMONIA
VESSELS



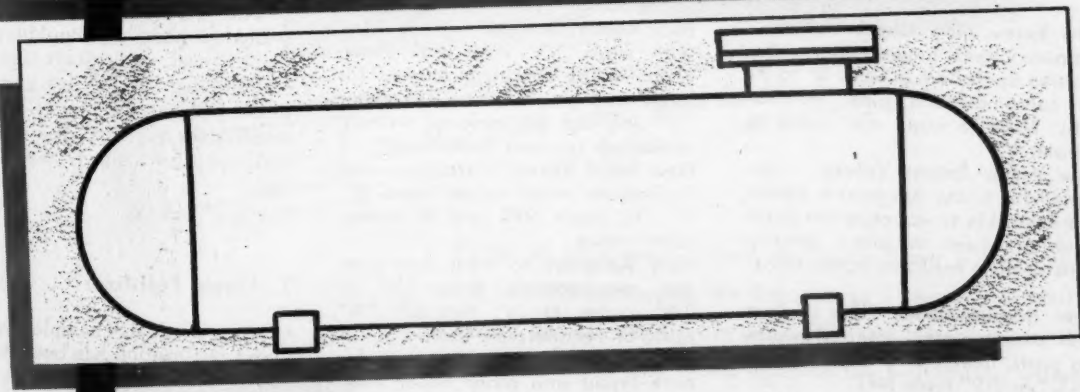
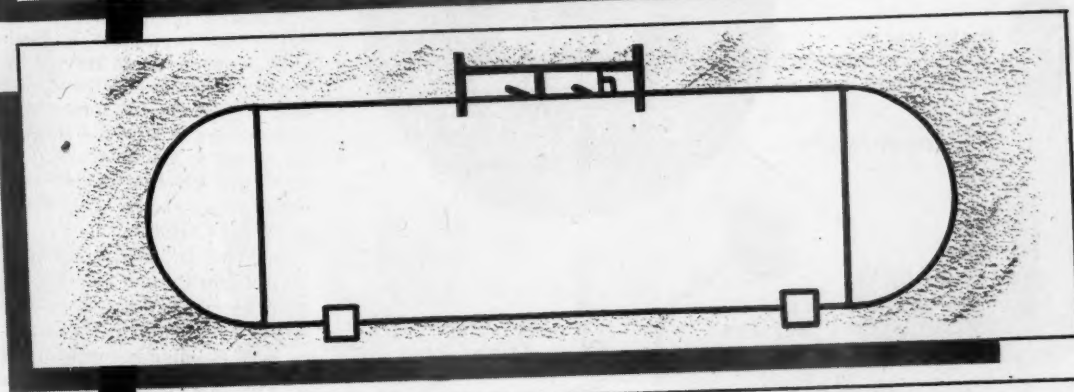
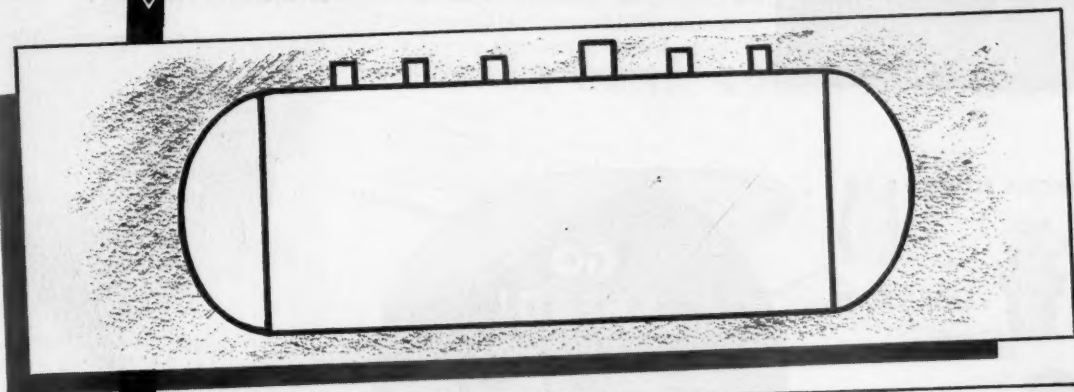
Superior
MFG. COMPANY

4110 N.E. EIGHTH AVE.
AMARILLO, TEXAS

ALL INQUIRIES ANSWERED PROMPTLY



ANHYDROUS AMMONIA FARM TANKS

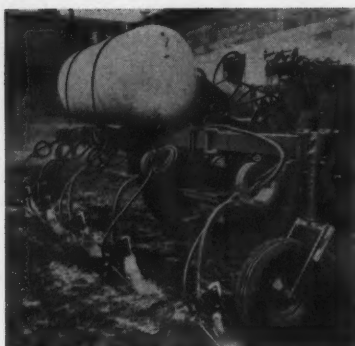


FARM SERVICE TANKS
500 and 1,000 gallons
TRAILER TRANSPORT
BULK STORAGE TANK
30,000 GALLONS

DWW, a leader in steel tank fabrication, uses the finest materials available in the manufacture of these top quality anhydrous ammonia tanks. Lightweight and featuring a streamlined construction, DWW Anhydrous Ammonia Tanks offer easier handling — easier installation. Built in strict accordance with ASME Code requirements for 200/250# working pressures. Meet all state requirements.

DW WHITEHEAD

D. W. WHITEHEAD MFG. CORP.
1218 Walnut Avenue - Trenton 9, N.J.

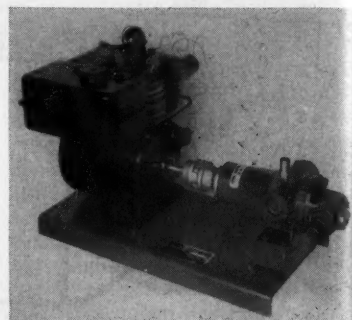


search in the field as to what is most needed in applicators and was designed specially for the problems such a machine must meet under actual working conditions.

Points stressed by the manufacturer include a 5-to-1 safety factor on any known stresses; a 4-in. square tube bar and frame for great strength; a constant, 26-in. high clearance; short, stubby, compact frame for short field turns; tool bar operated by hydraulic cylinder to permit control of level of knife penetration in

ground; tank and frame rigidly set to prevent wear; spring shanks designed for high clearance; safety gauge depth wheels on mounted applicator to eliminate tractor whip-sawing, keep end knives in ground and help eliminate bent and twisted tool bars. Pollard Manufacturing Co.

6. Displacement Pump



A positive displacement pump with power unit complete is made for anhydrous ammonia service by Viking Pump Co. This is the same pump that is sold for LPG operations except that for AA service it is directly connected to a four-stroke, 1 1/4-hp at 2400 rpm gasoline engine equipped with rewind starter. It is designated as Model GG198.

Included in its features are a carbon graphite inner bearing in idler gear; the vapor pressure safety relief valve on suction port is of steel; safety by-pass valve is set for 75 psi; O-ring head gasket is for non-leak operation; it has a dry liquid-type mechanical seal; pump shaft is supported by casing ball bearing and radial thrust ball bearing; it has a flexible coupling for quiet and positive operation, and it has a sturdy, welded steel base.

Viking Pump Co.

7. Liquid Fertilizer

A new method of complete and balanced fertilization has been developed by Plantation Fertilizers Corp. and is now available for commercial application. The liquid fertilizers will be sold under the trade names of "Nitra-Flo," "Nitra-Ease," "Phos-Flo," "K-Flo," and "Flo-Mix" and the company will manufacture and sell the equipment for applying them.

By including other needed nutrients with anhydrous ammonia, a more complete fertilization can be obtained than if just one nutrient is

EXCESS FLOWS

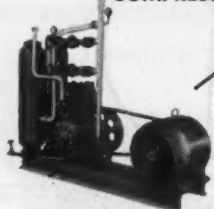


VAPOR VALVES



FILLER VALVES

COMPRESSORS



ROTARY GAUGES



**GO
AHEAD!**

with

RONEY

**ANHYDROUS AMMONIA
EQUIPMENT**



ADAPTORS



RELIEF VALVES

New Excess Flow Check Valves — Stainless steel moving parts for positive operation, in sizes 3/4" to 3" for container and pipe installations. Male to male and male to female.

New Vapor Return Valves — designed for filling operations where it is desirable to equalize the pressures in order to allow gravity transfer or to facilitate pump transfer.

New Double Check Filler Valves with stainless steel internal working parts. Inlet 1 1/4" and 2 1/4" Acme x 1 1/4" and 2" male NPT.

New Compressors and Turbine Type Pumps — wide range to meet all conditions from small plants to large bulk plant operations.

New Rotary Gauges — 3/4" to 1" — with triple "O" ring seal. Leak-proof — The complete answer for large and small tanks. The outer "O" ring can be replaced without removing contents from tank.

New Relief Valves — stainless steel hydrostatic relief valves sizes 1/4", 1/2", 3/4" male NPT and 2" safety relief valve.

New Adaptors to meet your special requirements. Sizes 1 1/4" or 1 3/4" acme to 1/2" through 1 1/4" male or female pipe thread.

New Tee Valves — 1" size — for tank liquid and other vapor combinations.

New Angle Valves — 3/4" and 1" for special hose and tank applications in combination with filler couplings, vapor couplings, bleeder valves, hydrostatic reliefs and hose connections.

RONEY

INC.

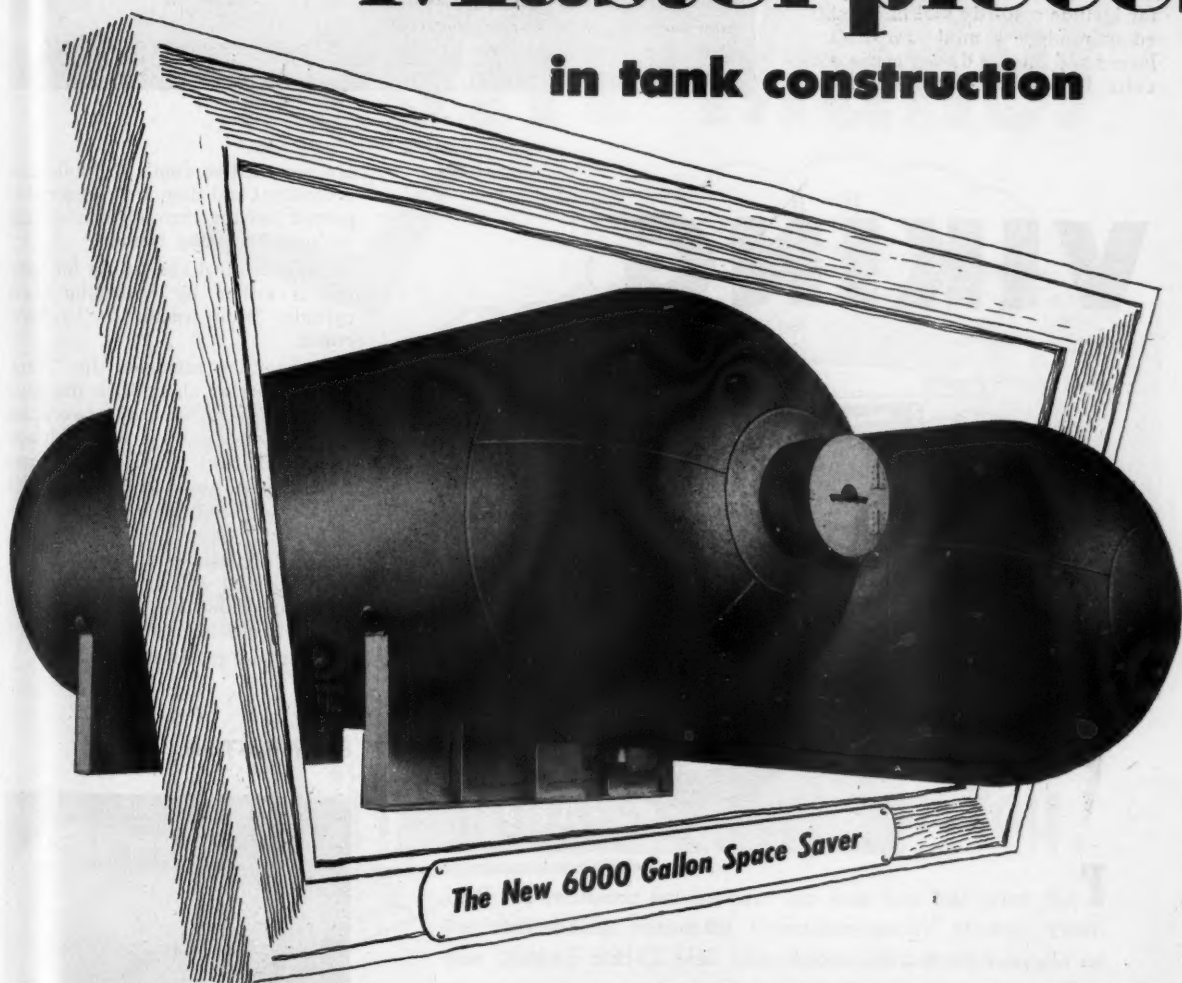
105 COLE STREET, DALLAS, TEXAS

EQUIPMENT AVAILABLE FOR IMMEDIATE SHIPMENT

Our **ANHYDROUS AMMONIA** Tanks are...

Masterpieces

in tank construction



The New 6000 Gallon Space Saver

Short on yard space? Then the *Space Saver* is the tank for you. By increasing the diameter to 7 feet, the overall length has been cut from 53' to 23' 10". Shorter length permits delivery by truck right to the foundation without special oversize highway permit. Comes with or without cradle. Available for immediate delivery. For the *Space Saver* or tanks of any size, call, wire or write today.

anhydrous Ammonia Tanks
all sizes including
30,000
GALLONS

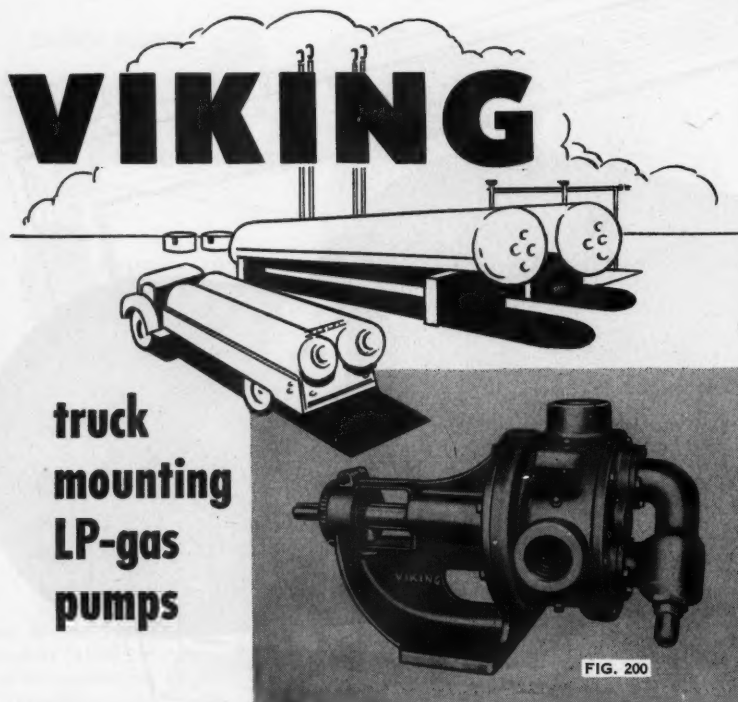
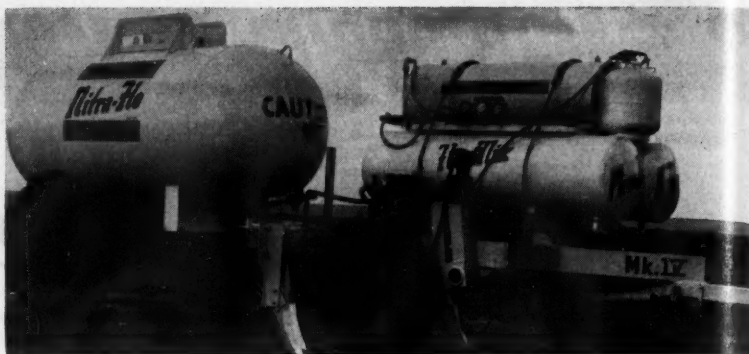


P. O. Box 5146 • Dallas, Texas

used, it is stated, and they are in a form that can be readily and immediately assimilated by crops.

In the process, the nitrogen from "Nitra-Flo", phosphorous from "Phos-Flo" and potash from "K-Flo" may be applied in any ratio that the crop or soil may require. "Flo-Mix" is the process for an economical, direct application of the complete fertilizer.

Features of the "Flo-Mix" applicator include a sturdy tool bar designed to produce a minimum draft so levees and ditches do not cause difficulty in operation. Applicator feet



**truck
mounting
LP-gas
pumps**

FOR sure, fast and safe delivery, specify Viking pumps on all your truck installations.

The complete range of sizes include 28, 38 and 70 G.P.M., operating at 400 R.P.M., 50 P.S.I. differential. Maximum

differential pressure, 100 P.S.I.

All pumps include mechanical seal, O-ring gaskets, non-lubricated pump bearings, integral thrust bearing and either safety valve on head or return-to-tank bypass valve.

Order these Viking Pumps in all iron construction for handling Anhydrous Ammonia.



Send for bulletin 2305B today. For the complete line, also ask for bulletins A2300B and SP-342B.



VIKING PUMP COMPANY
Cedar Falls, Iowa

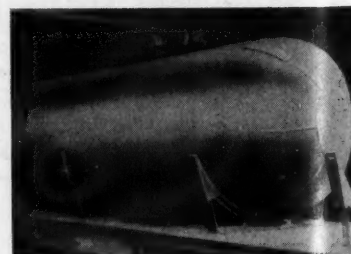
are mounted so depth of application is constant and they are staggered to permit passing through trashy land without becoming fouled.

Depth control and lifting for moving is either by hydraulic slave cylinder from tractor or by hand crank.

In handling nitrogen, the "Nitra-Flo" is carried along with the basic tool bar in a separate two-wheel trailer tank equipped with quick-attach trailer hitch and supply hose connection. This carries enough "Nitra-Flo" for from 6-to 10-hours operation.

The "Flo-Mix" machine is constructed so it will apply the desired amounts of the three different fertilizers simultaneously, and evenly. *Plantation Fertilizers Corp.*

8. Trailer Tank



American Pipe & Steel Corp. announces a new design of frameless tanks for trailers employing important advantageous changes, permissible by ICC only since May of this year.

The new construction and design makes possible a net increase of approximately 3½% in gallons over that of other single barrel frameless units which use heavier steel. It meets all requirements of ASME code, as well as ICC.

American Pipe & Steel Corp.

The Pioneer Profit Maker



OVER 7000 GALLONS ★ ASME-NB 265# W.P.



Thirty Dollars a Day for You!

Net Cash Utilizing the Famous
"LOADSHIFTER" Exclusive With "Pioneer"

Makes your trailer adaptable to any tractor enabling
you to pick up every available gallon of payload.

Write For Additional Information.

Liberal Terms Available.

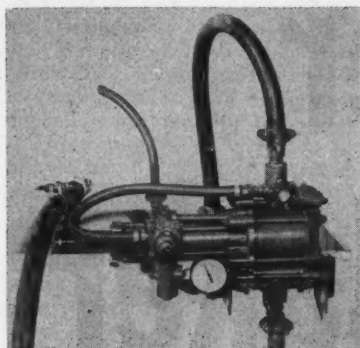


"EVERYTHING IN LPG AND ANHYDROUS AMMONIA"

The Pasley Mfg. & Dist. Co.

601 East 11th St., Kansas City, Missouri • Telephone Victor 2369

9. Vapor Pump



John Blue Co., one of the pioneer manufacturers in the anhydrous ammonia equipment field, is now readying for production a vapor operated transfer pump.

The pump uses ammonia vapor to effect transfer, thereby reducing bleeding loss about 95%. Flow rates of up to 20 gal. per minute, with losses of approximately 3/10 of 1%, can be achieved with the new pump, it is stated.

Requiring no outside source of power, the pump is very simple to mount and connect, and requires practically no servicing.

Extensive research and testing have gone into the development of this unit. Results have shown that the pump will pay for itself in a very short time through the saving in ammonia gas normally lost through bleeding.

John Blue Co. Inc.

10. AA Tank

Anhydrous ammonia storage tanks ranging in size from the 110-gal. tractor applicator tank to 30,000 gal. storage vessels are built by the J. B. Beaird Co.

All are made of special steel that will withstand vigorous tensile and bending tests. When approved, the steel sheets are cut and rolled mechanically and shell sections are

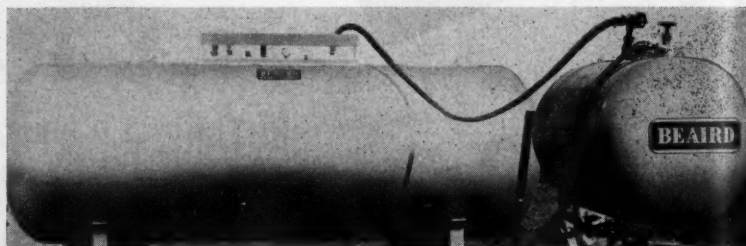
again checked to uncover any hidden flaws.

Radiographic equipment films the welded seams to show up any defects in the weld. Tanks are hydrostatically tested under 250-lb pressure. The welded seams are then pounded with sledge hammers, after which the water pressure is increased to 400 lb and seams are again tested for pin hole leaks.

After draining, special high grade fittings are installed. Tank bodies are then cleaned by pneumatic buffers and finished in white enamel to resist heat and protect the metal.

All necessary equipment for mounting, filling and dispensing is built into the storage equipment.

The J. B. Beaird Co. Inc.



A New, Profitable Sales Plan for LPG Dealers . . . Available Now!



a balanced nutriment for
soil and foliage application

For Lawns, Gardens, Flowers,
Shrubby and House Plants

Available in any quantity

UNI-CHEM, Inc., a new member of the UNIVERSAL family, presents a sales plan to LPG dealers nationwide to balance out their selling efforts and create a profitable "off-season" operation. This plan covers all 48 states . . . sold by franchised territories. Your inquiry will be handled promptly.

UNIVERSAL PETROLEUM COMPANY

Producers and Marketers of Petroleum Products

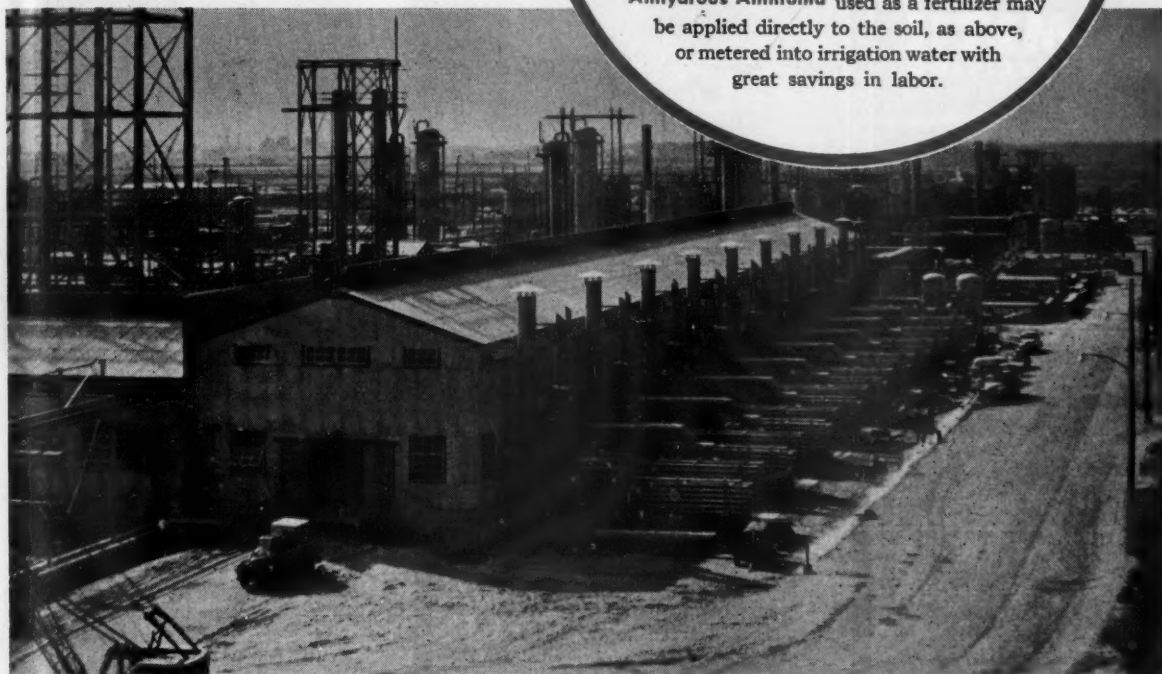
NATIONAL BANK OF TULSA BLDG., TULSA, OKLA. Cable: UNIFUELS



Phillips Doubles Production of AMMONIA



Anhydrous Ammonia used as a fertilizer may be applied directly to the soil, as above, or metered into irrigation water with great savings in labor.



● Phillips first began producing anhydrous ammonia in the Texas Panhandle in 1948. Now, to meet increased demand, the Company has started operation of a newly constructed plant at Adams Terminal near Houston, Texas. This new plant with a design capacity of 450 tons per day has increased Phillips ammonia output to approximately 1,000 tons per day.

Anhydrous ammonia contains 82% nitro-

gen—more nitrogen per pound than in any other nitrogen fertilizer. And nitrogen is essential to all plants for the production of protein for growth and reproduction. Today, it is in great demand on our nation's farms as a stimulant to higher crop yields.

For more information on this low-cost, convenient nitrogen fertilizer, contact the Phillips Division Office nearest you.

PHILLIPS CHEMICAL COMPANY

A Subsidiary of Phillips Petroleum Company



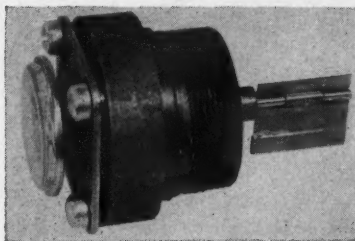
Offices in:

AMARILLO, TEX.—First Nat'l Bank Bldg.
BARTLESVILLE, OKLA.—Adams Bldg.
CHICAGO, ILL.—7 South Dearborn St.
DENVER, COLO.—1375 Kearney Ave.
DES MOINES, IOWA—606 Hubbell Bldg.
HOUSTON, TEX.—1020 E. Holcombe Blvd.

INDIANAPOLIS, IND.—1112 N. Pennsylvania St.
KANSAS CITY, MO.—500 West 39th St.
MINNEAPOLIS, MINN.—212 Sixth St. South
NEW YORK, N. Y.—80 Broadway
OMAHA, NEB.—WOW Building
PASADENA, CALIF.—604 Citizens Bank Bldg.

SALT LAKE CITY, UTAH—68 South Main
SPOKANE, WASH.—521 E. Sprague Ave.
ST. LOUIS, MO.—4251 Lindell Blvd.
TAMPA, FLA.—1214 South Dale Mabry
TULSA, OKLA.—1708 Utica Square
WICHITA, KAN.—501 KFH Building

11. Flow Indicator



The Corken flow indicator for anhydrous ammonia is an important instrument for installation in a liquid

flow line to tell the bulk plant operator when liquid is flowing and the direction of flow.

The indicator is non-electric and employs the magnetic coupling system between the flapper in the stream and the registering dial. The instrument is readable from a moderate distance with standout colors of red, black, and white being used on the dial face and pointer. The 2-in. diameter snap-on dial can be easily replaced or removed without bleeding down ammonia lines.

A 2-in. male pipe thread connection

enables installation to be made in a 2-in. tee or the side outlet of a 2½-in. by 2-in. or 3-in. by 2-in. reducing tee. The indicator will not indicate normal vapor travel in 2-in. or larger lines.

This type of indicator eliminates bulkiness, and cloudy and dirty glasses. There is little danger of breakage or puncture of glass, but it does not act as a check valve. Working pressure is 300 psi.

Corken's Inc.

12. Ammonia Applicator



Latest addition to the Gotcher line of anhydrous ammonia equipment is the GUC 3-point hitch applicator. This machine is designed for both row crop and broadcast application in soils where conditions do not require one of the larger pull-type models.

In pastures and rice it can be used after the land has been prepared for planting. On row crops it is designed for both pre-planting and side-dressing operations. The 3-point hitch attachment permits quick, simple mounting and dismounting, of special value for small or diversified farms with a minimum number of tractors. Unit has 60- or 100-gal. ammonia tank, heavy-duty coil tines, and an 8-ft tool bar. Approximate shipping weight: 600 lb.

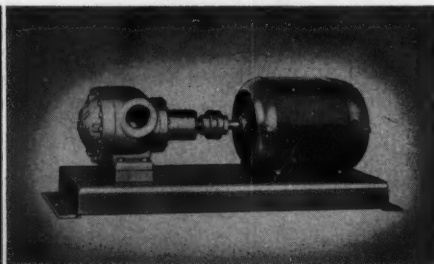
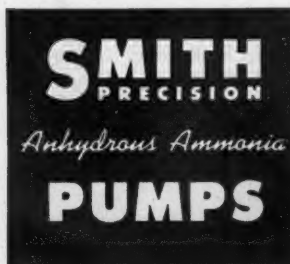
Gotcher Eng. & Mfg. Co.

13. Combination Valve

The S & L Manufacturing Co., manufacturers of anhydrous ammonia valves and fittings as well as L. P. gas equipment, is now making a new anhydrous ammonia forged steel hand-operated 1¼ in. combination liquid fill and withdrawal valve, No. 2690.



Through new techniques in construction, this valve permits greater, faster flow of liquids with far less back pressure and turbulence. It is made from steel forgings to assure rugged wear. Convenient wrench



ELECTRIC MOTOR MODELS

AMC-1
5 GPM with ½ HP, 1800 RPM Motor
10 GPM with ¾ HP, 3600 RPM Motor

AMC-1044
20 GPM with 1½ or 2 HP Motor

AMC-1044H
35 GPM with 2 or 3 HP Motor

AMC-2
50 GPM with 3 or 5 HP Motor

AMC-3
100 GPM with 5 or 7½ HP Motor

AMC-4
150 GPM with 7½ or 10 HP Motor

POWER TAKE-OFF MODELS

ATC-1044H — 35 GPM at 900 RPM

ATC-2 — 50 GPM at 500 RPM

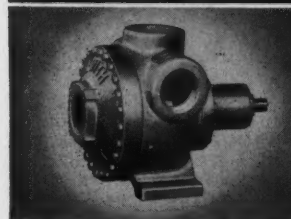
ATC-3 — 100 GPM at 500 RPM

Orders must specify that pumps are for use in anhydrous liquid ammonia service.

For more complete descriptions, see our ad in the Butane section of this magazine or write to the factory for catalog.

The many advantages proven in thousands of Smith Precision Pump installations are now available to you for Anhydrous Ammonia transfer.

1. No servicing of any kind required due to unique patented Smith Self-adjusting Packing.
2. Longer top efficiency due to better workmanship, better materials, better design. Latest developments are followed closely in all three fields. There hasn't been a single year gone by when Smith Pumps were not improved in some way.
3. No gear, belt, or chain-drive problems because both Smith Truck and Smith Bulk-Plant Pumps are designed for direct connection to power take-off or electric motor.



SMITH
PRECISION PRODUCTS CO.

1135 Mission Street, South Pasadena, California

Telephone, PYramid 1-2293

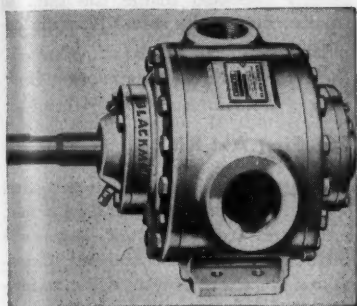
or PYramid 1-2691

pods are located above pipe threads. It also has 1/4-in. NPT outlet to accommodate bleeder or hydrostatic relief valves. Other outstanding features include easy-grip hand wheel, Teflon seats and positive leak-proof packing. Overall height: 6 in. closed and approximately 5 1/4 in. installed.

Another addition to the S & L anhydrous ammonia line is a forged steel 3/4-in. NPT hose line valve No. 2696. It features positive hand shutoff. This valve has three-way action suitable for adapters, bleed valve, relief valve, excess flow check and hose line coupling connections.

S & L Manufacturing Co.

14. Liquefied Gas Pump



The Blackmer Pump Co. is offering a rotary pump especially designed for handling liquefied gases such as propane, butane, and anhydrous ammonia. The pump has been extensively field tested and is designed for use as a truck pump or as a bulk plant unit.

The pump features anti-friction bearings located at both ends of the shaft and completely isolated from the pumpage. Cartridge-type mechanical seals are located on both sides of the rotor for controlling shaft leakage of valuable and hazardous products. This feature eliminates packing gland maintenance and protects the bearings from the pumpage. The seals are easily replaceable as a unit.

Standard construction provides non-metallic sliding vanes which are self-adjusting for wear. For certain liquefied gases, such as anhydrous ammonia, special composition vanes are furnished. The vane and liner construction makes these parts easily replaceable and affords low maintenance costs.

Blackmer Pump Co.

15. Semi-Trailer Tank

Superior Tank & Construction Co. has developed a new, maximum capacity anhydrous ammonia semi-trailer tank, constructed in accord-

BE PREPARED

to meet all regulations with HACKNEY AMMONIA TANKS



They're specially designed to keep pace with requirements in the fast-growing anhydrous ammonia industry. They're built to comply with both the ASME CODE FOR 265 POUND WORKING PRESSURE and ICC MC-330 SPECIFICATIONS. They're backed by more than 50 years' experience in the manufacture of pressure vessels and tanks—provide the safety, long-life and quality features you want.

Completely fitted with top-quality valves and ready for mounting on your trailer. Two large square baffles in each tank. Finished with two coats of paint for protection against the elements and in accordance with ICC MC-330—a tough base coat and a white enamel top coat. Properly stenciled for anhydrous ammonia service. Available in 500- and 1,000-gallon capacities. Your choice of 41" or 46" diameters.

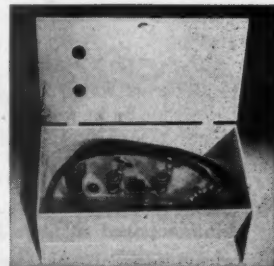
Under This Sturdy Cover—

Valves and openings are permanently identified—are arranged for easy servicing. Equipped with a complete, heavy-duty hose assembly which can be locked under the protective cover when not in use.

Choose Hackney Quality for All Your Ammonia Tank Needs

Applicator tanks are available with or without fittings, in sizes up to 150 gallons. Sturdy two-piece construction, with single circumferential weld.

Bulk storage tanks are available in sizes of 1745, 2550, 3360, 6000, 8000, 10,000, 18,000 and 30,000 gallons. Also intermediate sizes when required.



Write for details.



Pressed Steel Tank Company

Milwaukee 14, Wisconsin

Manufacturer of Hackney Products

1487 S. 66th St., Milwaukee 14 • 52 Vanderbilt Avenue, Room 2099, New York 17 • 227 Hanna Bldg., Cleveland 15 • 936 W. Peachtree St., N.W. Room 112, Atlanta 3 • 208 S. LaSalle St., Room 790, Chicago 4 • 552 Roosevelt Bldg., Los Angeles 17 • 18 W. 43rd St., Room 13, Kansas City 11, Mo. • 138 Wallace Ave., Downingtown, Pa.

CONTAINERS AND PRESSURE VESSELS FOR GASES, LIQUIDS AND SOLIDS



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Just fill in this coupon for Products information and copies of new publications, and mail to

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12/54 Fill in numbers of items in which you are interested.) No. _____ No. _____ No. _____ No. _____
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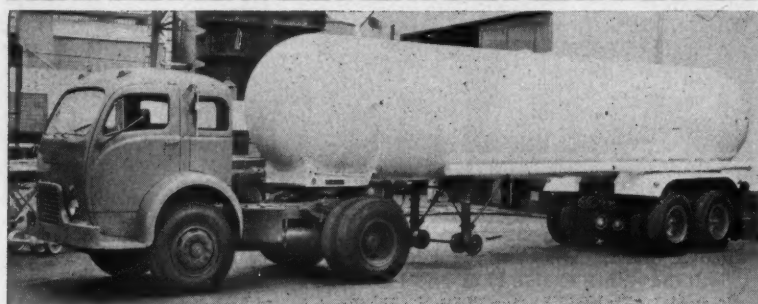
NAME AND TITLE _____

FIRM'S NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

For notices of more new products and trade publications turn to page 171 of the Power Section.



ance with ICC-MC330 and ASME 1952 codes for 265-lb working pressure, and utilizing the lightest weight steel of the required strength available.

This type unit is X-rayed, stress-relieved and of frameless integral construction. The manufacturer states that by incorporating frameless design and eliminating dead weight wherever possible, this unit increases maneuverability, provides added safety and gives greater payload and more profitable operation. Steel fittings are used exclusively. The tank outlets are installed in such a way as to offer the greatest protection in case of possible accident, and in many cases these fittings are completely recessed inside the tank to further insure the safest possible operation.

Superior Tank & Construction Co.

16. First Aid Kit

Now available is an all-new first aid kit, designed specifically for fast, effective treatment of ammonia burns. Developed on the recommendations of users of anhydrous ammonia, the new kit contains a complete assortment of treatments and items

JUST what you have waited for and needed. An Applicator designed especially for pastures **PLUS** a seeding attachment to plant cereal and grass crops in pastures over anhydrous ammonia . . .

Pasture Dream®

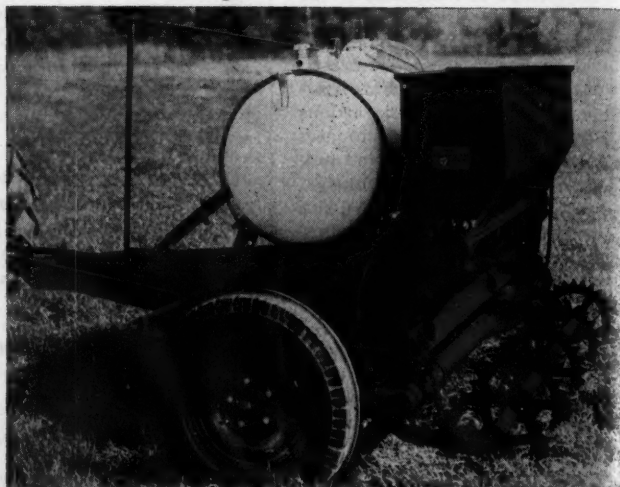
APPLICATOR

Manufactured in three Models—A-60, A-80, for sod use only and an A-120 for sod and row crop. Seeder available on all models.

Using seeder attachment you can apply both solid and NH_3 fertilizer at same operation.

Agronomists and Agricultural Engineers recommend band seeding and fertilization for all grass crops. Method produces amazing results by the concentrated effort in the row or band.

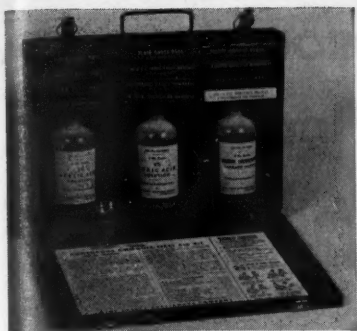
**KEEP PASTURES GREEN
WITH PASTURE DREAM**



Pasture Dream Sod Applicator Model A-80 with seeding attachment.

TAYLOR MACHINE WORKS

AGRICULTURAL DIVISION
LOUISVILLE, MISSISSIPPI

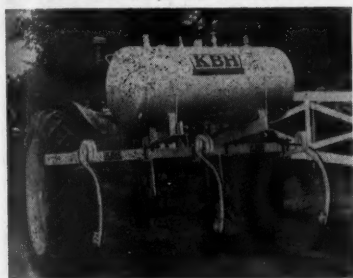


for every ammonia burn emergency. A special instruction sheet provides users with proper first aid procedure.

The case is of "all-weather" construction, 20-gauge steel, finished in durable baked enamel. A rubber gasket seals out dust, moisture. Mounting brackets permit attaching to wall or vehicle.

Edward S. Nelson Ltd.

17. Applicator



The KBH Corp. has recently introduced a rear-mounted unit for Case tractors with "Eagle-Hitch" hook-up.

This unit is available with the 8-ft tool bar (as shown); or with a 14-ft tool bar, either rigid or hinged. Its high clearance features permit both pre-planting and side-dressing applications in row crops.

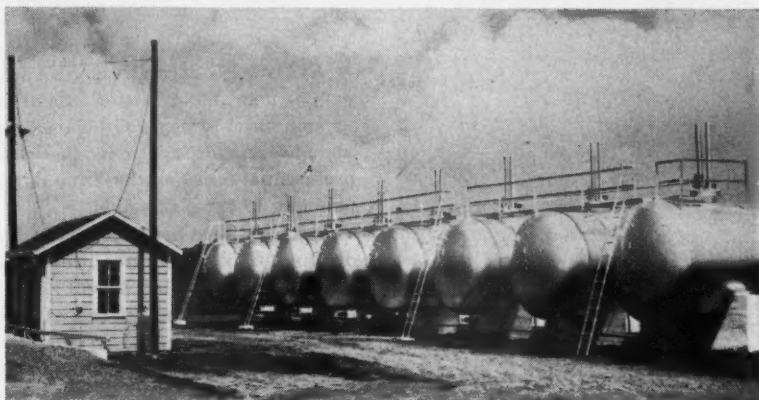
Heavy-duty, spring coil shanks or rigid shanks are interchangeable on this new unit to meet varying soil conditions. The ammonia tank is mounted directly on the tool bar, placing additional weight on the applicator shanks and knives to permit maximum penetration while applying.

This unit can be designed for a combination propane and anhydrous ammonia operation. In many cases a propane tank is designed for an anhydrous ammonia payload, thus allowing for the possibility of an anhydrous ammonia operation at a later date.

This applicator has rugged, extra-strength construction. Also available for other make tractors.

The KBH Corp.

Get Into The New, Rich Anhydrous Ammonia Field!



Add AMMONIA STORAGE To Your Present LP Gas Business

AMMONIA INDUSTRY IS BOOMING!

You can cash in on the booming farm market for anhydrous ammonia — the miracle 82% nitrogen, liquid fertilizer that's doubling yields on farm lands throughout the U. S. This fast growing industry offers excellent opportunities in ammonia storage and distribution, a natural sideline for LP Gas dealers. New and larger manufacturing plants have increased the supply of ammonia so that it's now available in nearly every section of the country.

GET THE FACTS FROM NELSON!

In a highly technical, specialized field such as the engineering and construction of anhydrous ammonia storage plants, there's no substitute for experience. That's why Edward S. Nelson, Ltd. has installed more ammonia bulk storage systems than any other firm in the country. Storage plant operators in this fast-growing industry specify SYSTEM NELSON because they KNOW they're dealing with an experienced organization, equipped to do the best job possible. If you're considering ammonia storage, you'll profit by a meeting with one of our sales engineers.

Write TODAY For Information On A System Nelson Storage Plant. Illustrated Literature Available.



EDWARD S. NELSON, Ltd.

"First in the Bulk Storage Field"

CLARKSDALE, MISSISSIPPI



Front View



Back View

**If YOU want QUALITY at
REASONABLE COST ask for
MANCHESTER
Anhydrous and Aqua
APPLICATOR UNITS**

- Sturdy Construction
- Adjustable Hitch
- Wheels adjustable from 72" thru 96"
- Hydraulically operated
- Straight Shanks
- 1 1/4" Coil Shanks
- Replaceable Shoes
- Four Regulator Equipped Models
- Four Positive Displacement Pump Models
- Units may be used for side dressing or open field application.
- Attractive Implement Colors
- Choice of regulating equipment

MANCHESTER also offers a complete line of ammonia tanks from 40 gallons to 250 gallons.

For HIGHER PROFITS
write or phone —

**Manchester
Welding & Fabricating
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BPN ANHYDROUS AMMONIA

How Can You Finance An AA Operation?

By **Lynn C. Denny**
Associate Editor

FINANCING an anhydrous ammonia operation or raising capital to expand an existing LPG business to include anhydrous ammonia gets preferential consideration from those planning to enter this field.

Every business firm has its own individual problems and requirements, influenced directly by current assets, present sales volume and profits, and contemplated program. Generally speaking, money is the answer to all of them.

If a new business is started money is needed for capital investment—that is, to build or established operating facilities, purchase stock and provide housing. If expansion of an existing business is the desire of a firm, capital is also needed for the same requirements in order to handle the larger undertaking.

Where is such capital to be found? How shall one proceed to obtain it and what will it cost?

If the money one wishes to borrow can be repaid within a short time—say, three months to a year—a local bank is a quick and appropriate course. But banks do not like to take long-term paper, and this has opened up the way for large credit corporations to establish a policy that enables a business to arrange financing for longer periods of time.

Retail stores can borrow money at banks to cover shipments of goods, sell such goods promptly, and repay their loans accordingly, because their turnover is fast.

It is a very different story when a firm handles a product like anhydrous ammonia. Here the big problem is financing heavy investments in tanks for bulk storage, tank trucks, transports, trailers, skid tanks, applicators, tractors and other equipment.

The payment for and distribution of the product has been and still is a problem for both the producer and

the distributor of anhydrous ammonia. There is a natural reluctance on the part of the distributor to store ammonia in the "off season," because he cannot afford to tie up his working capital at a time when he is not receiving income from the sale of the product. This has caused a bottleneck in transportation as well as production. To help relieve this situation, many suppliers are giving deferred billing on products stored in the fall months. This has likewise encouraged fall application of ammonia.

It is easy to see that usually financial assistance must be secured to conduct such a business. Hence, a logical source is a credit corporation which is in a position to make available to established firms, or to those whose assets are sufficient to warrant it, a long term credit plan which permits the purchase of capital assets on a "pay as you go" basis.

The applicant for a loan prepares a financial statement showing the condition of his business, details of his assets in real property, inventory, equipment and current income. An estimate is made of needed capital and a plan of possible repayment indicated.

When applying for financing assistance, it is wise to list all possible needs at first rather than to have to apply for more help later. In order that the essential requirements for an AA operation may not be overlooked, here is a list of equipment to be included: bulk plant storage tanks, pump, compressor; mobile field storage tanks; tank trucks, truck tanks, transports; tractor and application equipment; customer storage tanks.

While AA distributors will have varied needs, there are more or less standard terms for financing which will be a guide to firms considering

making application for funds. These particular plans, presented in some detail below, have been furnished by the LPG Credit Corp. of Cleveland, a firm that has long been performing in like manner for the liquefied petroleum gas industry, and will show the prospective borrower what conditions he will have to meet to qualify.

Entitled "Resume of LPG Credit Corp.'s Anhydrous Ammonia Equipment Financing Plan," the entire plan is available to interested parties whose credit will qualify them for the corporation's requirements. The most important of the clauses stipulates that on bulk storage tanks, field tanks, pump and compressor, the lending company requires a 20% cash down payment by the applicant. Then he is given from 12 to 60 months to pay out the balance on equal monthly payments, covered by a conditional sales contract or chattel mortgage, as required by state law on equipment.

Tank trucks, truck tanks, transports, tractors and applicator loans require down payments of 25% and the balance amortized in 12 to 24 months. Here again, the conditional sales contract or chattel mortgage covers the unpaid portion.

Consumers' needs, covering field storage tanks, tractors and applicator equipment, require down payments of 25% on total cost, with balance in 12 to 24 equal installments.

Also, a special two crop seasonal income plan of financing retail sales is available to dealers whose financial condition qualifies them.

In all cases, the required procedure is to supply the credit corporation with a late financial statement giving all important information regarding the amount and type of financing desired and the name of the fabricator from whom you are purchasing your tanks. Also state size of your ammonia contract, your supplier, the amount of your present storage and present miscellaneous equipment.

Of course, it is assumed that before a distributor makes plans for financing his prospective AA undertaking, he has ascertained that there is a good potential for sales in his territory and that local soils need and will profit from the application of this fertilizer. Elsewhere in this section are discussions of this vital problem.

*We cover every
angle of the
Ammonia Industry!*

In recent years, the growth of ammonia fertilization in American agriculture has been phenomenal. It is estimated that over 28,000 tons of ammonia will fertilize 9 million acres of farm land in 40 states during the current year. This means that ammonia handling hose, for tanker, tank car, tank truck, mobile tank applicator, is becoming increasingly important to this growing industry.

Hewitt-Robins offers a custom hose for each of these services!

**FOR ANHYDROUS AMMONIA TANKER
LOADING AND UNLOADING . . .**

We recommend our Propane tanker hose. An extra strong, rugged construction in 6" and 8" internal diameter sizes, Hewitt-Robins Propane tanker hose is custom built for this hazardous high pressure service. *Its service history in loading and unloading propane tankers is unexcelled.*

**FOR TANK TRUCK AND TANK CAR LOADING
AND UNLOADING . . .**

We suggest our Monarch Wrapped Duck type, constructed with a special synthetic tube to resist permeation; Monarch Wrapped Duck Anhydrous Ammonia Hose contains a strong, non-collapsing wrapped duck carcass, protected by a green, sun and weather resistant cover.

FOR BULK DELIVERY TRUCK UNLOADING . . .

We suggest Hewitt-Robins Monarch molded and braided type which is available in 1/2", 3/4" and 1" sizes. A non-permeable tube, double braid of strong

rayon cord, and green neoprene cover results in a light, flexible hose easy to handle and reel. This hose is suitable for 350 psi maximum working pressures, with more than the required factor of safety. Monarch can also be used on those applicators requiring a high pressure line between the storage tank and regulator.

FOR THE MOBILE TANK APPLICATOR

On mobile tank applicators we recommend Hewitt-Robins Servall Applicator Hose between the regulator and applicator knives. Available with red or green cover, this all-neoprene hose resists ammonia permeation, thereby minimizing toxic odor, and is unaffected after constant exposure to sunlight and weather.

FOR AQUEOUS AMMONIA SERVICE . . .

Servall all-service hose is ideal for aqueous ammonia service on mobile spray applicators or for nitrogation. Its synthetic tube resists permeation while the red neoprene cover prevents damage from sun and weather.

HEWITT  ROBINS

Executive Offices, Stamford, Connecticut

DOMESTIC DIVISIONS: Hewitt Rubber • Robins Conveyors • Robins Engineers • Restfoam
FOREIGN SUBSIDIARIES: Hewitt-Robins (Canada) Ltd., Montreal • Hewitt-Robins Internationale, Paris, France • Robins Conveyors (S. A.) Ltd., Johannesburg • **EXPORT DEPARTMENT:** New York City.

Agricultural aqua ammonia usually contains about 30% ammonia to 70% water and in such a ratio it exerts no pressure at temperatures below 70° F. Only 10 psi pressure develops at 110° F and therefore it can be stored and transported under normal temperatures in non-pressure

BPN ANHYDROUS AMMONIA

**Nature and Application
of Aqua Ammonia**

Aqua ammonia is shipped in non-

While tanks for storing a 30% solution of aqua ammonia need be no heavier than those for gasoline, the heads should be convex so they will withstand the modest pressure of 10 lb at 110 F.

Uniformity of ammonia distribution is enhanced by maintaining the ammonia concentration in the irrigation water at a very low level not to exceed 110 parts ammonia to one million parts of water. Analysis has shown that with such a concentration there is practically no loss to the air in as much as 800 ft of furrow, and the nitrogen concentrations have been uniform throughout that entire length. However, the furrow should be covered after irrigation.

BUTANE-PROPANE News

Anhydrous Ammonia...a new source of income

NEW SPECIAL TRUCK

...keeps orders rolling



Built with specially designed flat-leaf-type spring bolsters for cradling a 1,000-gallon anhydrous ammonia tank, this new Case Wide-Tread Farm Truck supports the 7,650-pound gross weight of the tank loaded with NH_3 . With automobile-type steering, it trails safely without whip or shimmy behind automobile, motor truck or tractor at normal highway speeds. Its extra strength and flexibility also withstand strain when moving across rough ground to refill applicators working in the field. Unit can be equipped with electrically operated wheel brakes for even safer road travel. See your Case dealer or write for catalog to J. I. Case Co., Dept. M-324, Racine, Wis.



CASE

→ **DESIGNED**
→ **TESTED**
→ **APPROVED**
for Successful
Application

BLUE

**ANHYDROUS
AMMONIA
EQUIPMENT**

Send for
NEW FREE
catalog

JOHN BLUE Co., Inc.

HUNTSVILLE, ALA.

Dependable Farm Equipment
since 1886

There is a Model for Every Need

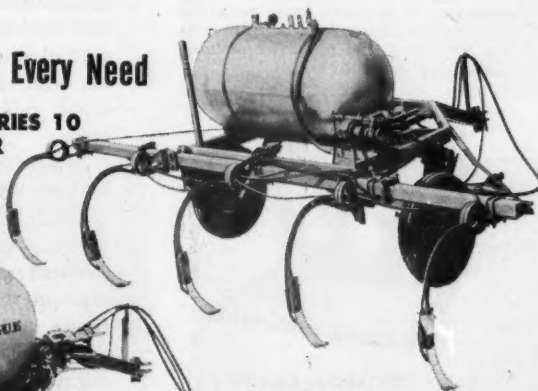
**NEW MODEL SERIES 10
NITRO-SHOOTER
DELUXE**

An economy special
14' folding tool bar,
5 spring tine applicators



**NITRO-SHOOTER
MODEL "UH"**

High clearance
(30" row crop clearance)
Coulters and Sealers
available for all models

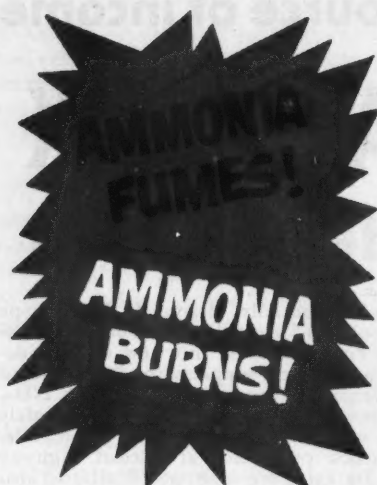


**SERIES 20
NITRO-SHOOTER
DELUXE**

14' folding tool bar
250 gallon tank,
5 spring tine applicators



World's Largest Manufacturer of Anhydrous Ammonia Equipment



M-S-A Equipment puts you on guard!



M-S-A AMMONIA MASK

This Mask's proved protection, wearing comfort, and durability make it the No. 1 choice in any job where ammonia is a breathing threat. "All-Vision" Facepiece protects entire face. Large lenses

permit maximum job vision, and will not "fog up." U.S. Bureau of Mines Approved. A complete line of masks for other refrigerants, self-contained Breathing Apparatus, and protective clothing is available. Write for bulletins.



M-S-A ANHYDROUS AMMONIA FIRST AID KIT

Here is an all-new First Aid Kit designed specifically for fast, effective treatment of ammonia burns. Developed on the recommendations of users of anhydrous ammonia, the new kit contains a complete assortment of treatments and dressings. A special instruction sheet provides users with proper first aid methods.

The case is of "all-weather" construction. 20 gauge steel, finished in durable, blue baked enamel. A rubber gasket seals out dust, moisture. Mounting brackets permit attaching to wall.

Be prepared for emergencies... write for details



MINE SAFETY APPLIANCE COMPANY
201 North Braddock Avenue
Pittsburgh 8, Pa.

Anhydrous Ammonia Needs Its Own Salesmen

By G. W. Gray
Verkamp Ammonia Inc.
Cincinnati

ALTHOUGH some of the physical characteristics of ammonia are similar to those of propane, there are large differences in many respects.



The role of the distributor is largely in the sales field, and there is little similarity here between the two gases. Sales efforts are in an entirely new direction with entirely different personnel.

Soil chemistry and its relation to the growth of plants is a very technical subject, and we would not recommend that anyone enter this field without having made a careful study of problems involved, with special attention to the crops raised in the particular areas.

In the Ohio area fertilizer season consists of only two months, basically May and June. This necessitates heavy investment in seasonal storage equipment and railroad terminal facilities. This shows up to a very poor advantage against other products which might sell the year around.

Basically, anhydrous ammonia furnishes only one of the approximately 15 nutrients required by growing plants, and, if materials such as phosphate and potash are not present in proper proportions, increases in crop yields will not justify the farmers' expenditure on ammonia. We feel that the distribution of the other nutrients, along with ammonia, should be given consideration, and much is being done experimentally with fertilizers of this type in liquid form. We find also that the sale of nitrogenous water solutions is being promoted by some firms.

We are of the opinion that generally there is a definite upswing in the use of nitrogen. Its high cost has been a retarding factor in the past. It is our hope that price competition will not force ammonia too rapidly into the narrow profit condition in which the dry fertilizer industry, and the L. P. gas operator in certain areas, seem to find themselves.

Naturally, the different crop and soil conditions which exist in various parts of the country will bring about different distribution methods and policies. Since the industry is so new, there no doubt will be many changes and innovations in the future.

Anhydrous Ammonia Advertisers

American Car & Foundry Co.	95	Manchester Welding & Fabricating Co. ...	114
American Cyanamid Co.	64	Master Tank & Welding Co.	105
American Pipe & Steel Corp.	63	McNamar Boiler & Tank Co.	70
Anco Mfg. & Supply Co.	62	Meeder Equipment Co.	116
Bastian-Blessing Co., The	90-91	Mine Safety Appliances Co.	118
Beird Co., Inc., The J. B.	97	Nelson, Ltd., Edward S.	113
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Bohnhardt, C. F. H.	116	Pasley Mfg. & Dist. Co., The	107
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Corken's, Inc.	68	Reliance Regulator Div. of	
Gates Rubber Co.	99	American Meter Co.	120
Gotcher Eng. & Mfg. Co., Inc.	98	Roney, Inc.	104
Graver Tank & Mfg. Co., Inc.	67	S & L Mfg. Co.	119
Henry Valve Co.	66	Smith Precision Products Co.	110
Hewitt-Robins, Inc.	115	Superior Mfg. Co.	102
Howe Ice Machine Co.	98	Superior Tank & Construction Co.	69
KBH Corp., The	71	Taylor Machine Works, Agricultural Div.	112
Little Air Products Co., Div. of		Universal Petroleum Co.	108
Union Carbide & Carbon Corp.	101	Viking Pump Co.	106
Lubbock Machine & Supply Co.	72	Whitehead Mfg. Corp., D. W.	103

On the island of Hawaii in the shadow of two giant volcanoes, butane plays an increasingly important role in the preparation of Kona coffee. This fine blending coffee, Hawaii's principal export, is sold to mainland coffee companies to add body to their own blend of Brazilian or Colombian beans.

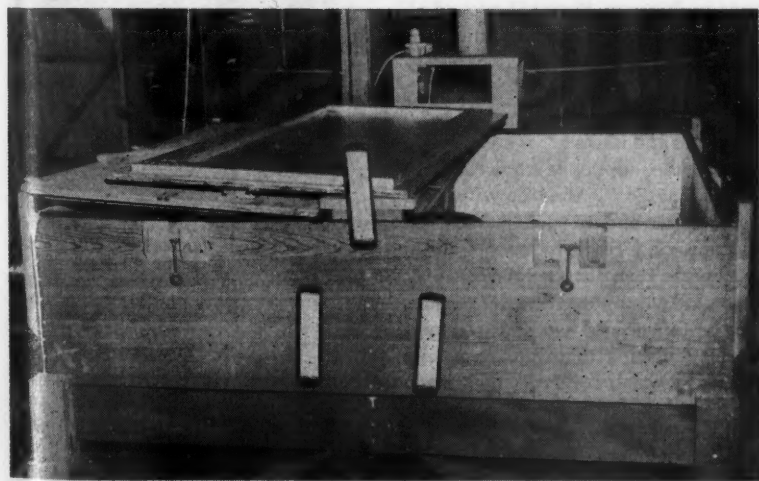
Butane Dries Coffee "Cherries" Faster, Easier, Cheaper



Left: This coffee tree of the Kona district on Hawaii is laden with coffee "cherries" which will be ripe in a few months. The unimpressive bush-like tree grows in thin soil over lava flows from a nearby volcano.

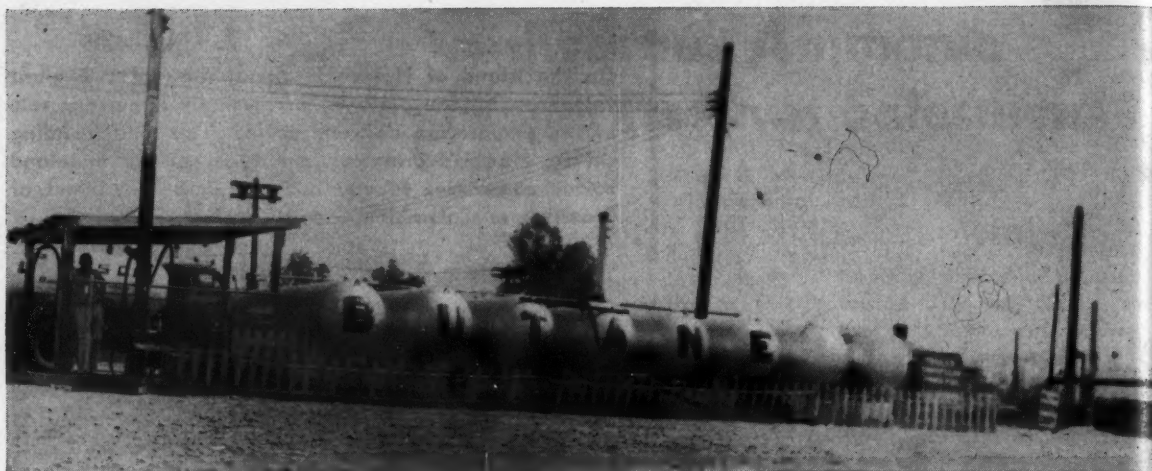


Right: The old method of open or sun drying coffee beans requires good weather and frequent raking. With ideal conditions, a 100-lb bag of the beans can be dried in three days.



In contrast, the crib of this coffee bean dryer, developed by the University of Hawaii for the benefit of Kona coffee growers, holds 8 to 10 bags of coffee "cherries" and dries them in 8 to 12 hours. The dryer utilizes a Security In-a-Wall furnace fueled with butane. The blower in the furnace circulates the heated air inside the crib, speeding the drying of the beans. This type of dryer is especially popular with the small Kona grower; it has high drying speed, is easily operated, compact, clean, requires little or no maintenance and is reasonable in price to operate, costing the farmer an average of 58 cents per bag. While installation costs vary slightly, the average for this butane unit is \$500, as compared to an average of \$1500 for an oil unit of similar capacity.





Bulk storage belonging to the Butane-Propane Gas Co. in Tucson, Ariz. Company supplies small homes and trailers in the area.

Keep Those Bottles Bright!

By Gene Creighton

ERNEST RICHTER, head of Butane-Propane Gas Co. in Tucson, Ariz., has a large volume of bottle gas business, supplying small homes, trailers and other drive-in customers who prefer to use bottles instead of underground tanks.

One of the reasons for the fact that many of his customers drive long distances out of their way to pick up L. P. gas supplies from Mr. Richter is that he invariably provides them with a bright, attractive bottle covered in silvery aluminum paint, which any customer can display with pride. Where such customers have often, in the past, been disappointed in receiving in exchange a battered, unattractive cylinder, all of those that go out from the Richter stock are as bright and shiny as when they left the factory.

The secret, according to Mr. Richter, is a simple policy of spraying each received bottle as it comes in if there is the slightest discoloration, scratch or rust spot showing. Normally, this would be an expensive operation, but through experimentation, Mr. Richter has found a simple solution which has done much for the appearance of his cylinders.

The secret is using pressure-type spray cans, which are provided by the manufacturer, with a finger operated spray nozzle, requiring no air hose attachment or pump. While various colors of paint, put up in spray cans in this way, have not proved altogether successful, aluminum paint has received the approval of every user and Mr. Richter is an enthusiastic booster for the method.

Bottles and tanks are merely set up behind the appliance showroom in North Tucson, washed down with a hose, grease and oil spots rubbed off; the spraying requires only 5 to 10 minutes to turn out a bright, "factory smooth" paint job. Smaller bottles can be finished in two or three minutes by placing them on a rotating spindle, which Mr. Richter made from an old-fashioned phonograph, and revolving the bottle as it is sprayed.

Due to the fact that he purchases the aluminum spray cans in large quantities and at low prices, painting cost is actually less than if an expensive spray gun and power operated compressor had to be used. Mr. Richter feels that the slight extra effort involved in making certain that every



To spray his bottles Ernest Richter sets them up behind his appliance showroom and uses a pressure-type spray can. Large cylinders require 5 to 10 minutes spraying; smaller ones only 2 to 3 minutes.

bottle appears at its best is more than repaid in the large amount of repeat business and good will received from customers.

This Arizona L. P. gas dealer divides his volume at present between bottle gas and bulk delivery. The bottle gas part is growing rapidly and Mr. Richter feels this is due in no small part to the bright, "always new" bottles he gives his customers.



How Would You Like to be SERVED Like a **MAHARAJA?**

*Just a nod of the head
A wave of the hand
Gets a Maharaja
The best in the land.*

Texas Natural can't serve you the great variety of "commodities" that are at the call of a Maharaja, simply because Texas Natural specializes in just one thing . . . *LP-Gas*. But when you need *Propane* or *Butane* — call *Texas Natural*

and get the kind of **SERVICE** you would expect, and demand, if you were the top Maharaja of them all.

You see, LP-Gas is not a side-line with Texas Natural. We manufacture the gas we sell. Our fleet of TEXGAS tank cars is one of the largest in the industry and our reserve storage is second to none.

So, Winter or Summer, Spring or Fall, for the kind of service you want . . . and for the contract you need, call, wire or write Texas Natural.



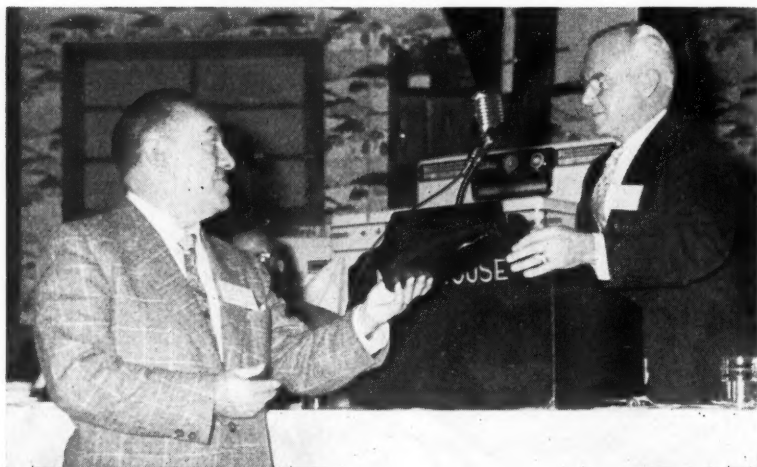
PROPANE • BUTANE • NATURAL GASOLINE—Phone 3-0123 Wire TU 190

DECEMBER, 1954

123



ASSOCIATION NEWS



Forrest Fram, outgoing president of Ohio LPGA, presents to **Edward E. Schaff** a plaque in honor of Mr. Schaff's forming the Ohio LPGA in 1948. Mr. Schaff is with Schaff-Vaughn, Springfield.

Bogey Men Haunt Ohio Convention

Three bogey men were seen at the Ohio convention as C. T. Burg, vice president in charge of sales at Iron Fireman Manufacturing Co., Cleveland, talked about "inertia," "pessimism" and "delay." At the conclusion of his talk, these three figures were knocked over by tennis balls thrown from the audience.

Two hundred sixty persons attend.



William H. Everett, incoming president of Ohio LPGA, presents to **Forrest Fram**, retiring president, on behalf of the association a silver tray in recognition of the work Mr. Fram has done during the past year.

ed the convention, held at Neil House in Columbus, and saw the accompanying trade show.

William H. Everett was elected president of the association for the coming year. A vice president in 1954, Mr. Everett is responsible for the safety program which has been so successful. A member of the Ohio LPGA since its beginnings in 1948, Mr. Everett is owner of Ever-Gas, Bridgeport.

During the convention **Forrest Fram**, outgoing president, presented to **Edward E. Schaff** a plaque in honor of the founding of the association in 1948. Incoming President **Everett** presented Mr. Fram, on behalf of the association, a silver tray in recognition of the work he has done this past year.

Undercover Agent Addresses Oklahoma Meet

An extra dividend was given those attending the 10th annual convention of Oklahoma L. P. gas Association held in Oklahoma City recently by an unscheduled appearance on the program of **Herbert Philbrick**, former undercover agent of "I Led Three Lives" fame. He has a television series by this name and is also author of the book by the same name.

Rapt attention was given the speak-

er as he told how he worked for the Communists for nine years while counter-spying on them for the FBI.

Jeff T. Boucher, Standard Fuel & Appliances Inc. of Tulsa, presided over the conference.

Lewis M. Mitchell of Standard Gas & Equipment, Clinton, was elected president, succeeding Mr. Boucher. **Carl Williams**, Butane Gas Co., Sulphur, and **Sherman Spradling**, Tri-County Butane, Hollis, were elected vice presidents. **Glenn Springer** was reelected secretary-treasurer.

K. R. McHenry of RCA, talking on "FCC Problems and Their Solution" told how the Oklahoma L. P. gas dealers, following the pattern set up by dealers in Arkansas, can band together into a cost sharing radio-using group to operate on a common frequency. "This will conserve the limited number of frequencies available," he pointed out, "and save dealers a great deal of money."

In presenting a talk on "L. P. gas—To Have and To Hold" **W. F. Devoe**, Phillips Petroleum Co., talked about the factors that enter into the manufacture of L. P. gas. He pointed out that sales in Oklahoma of all L. P. gas products in 1953 totaled 129,000,000 gal. which is slightly over 27% of the L. P. gas produced in the state. "It is to the producer's advantage" he pointed out, "except in unusual cases, to sell Oklahoma-produced L. P. gas in Oklahoma." He also pointed out that many people in the LPG business have a mistaken and misguided idea about underground storage being the answer to all the present ills which face the industry.

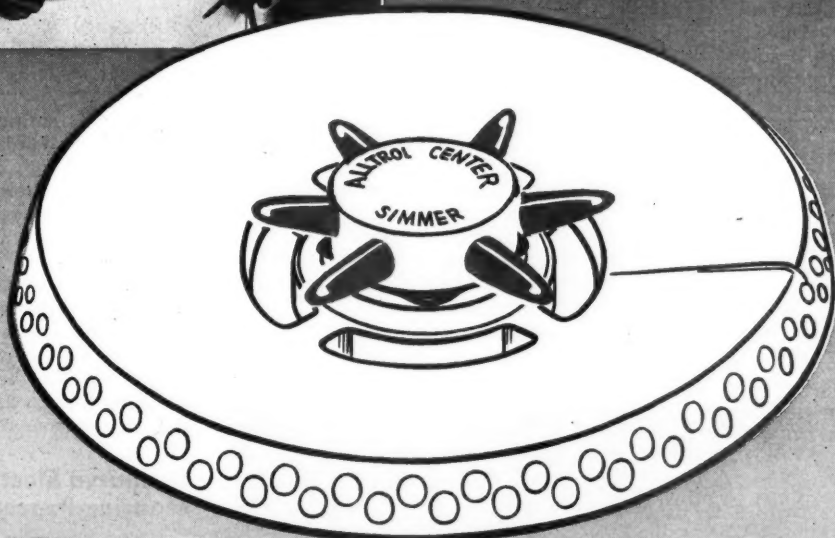
Chief G. R. McAlpine of the Oklahoma fire department presented a talk on "Safety." **Robert R. Sesline**, past president of the Oklahoma City sales executive club, spoke on the subject "Handcuffed by Bad Habits" and **J. M. Hazelett** spoke on the subject "A Profit is Not Without Honor." **C. I. Blackwood** and **Frank Streetman** were luncheon speakers.

Keith Wood of **Corken's**, former student of Technical Institute of Georgia, gave a five minute talk about supporting the L. P. gas division of the school by funds for scholarships and by hiring graduates as employees in the industry. **Amos Bak-**



...the quick, easy way to open their eyes—and purses!

FREE SALES IDEA BOOK... "How To Sell More Gas Ranges" is yours for the asking. Contains a dozen simple, dramatic demonstration ideas you can use profitably.



HARPER-WYMAN COMPANY

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ORIGINATORS OF CENTER SIMMER BURNERS

er, Shell Oil Co., presented a film before the breakfast.

The convention concluded with a banquet and dance. Tom Mitchell was chairman of the convention committee and Mrs. Glenn More was chairman of the women's committee.

Nevada Association Holds Convention at Las Vegas

The Nevada Liquefied Gas Dealers' Association played host to 120 registrants during its annual convention and trade show held recently at the Last Frontier hotel in Las Vegas. In addition to numerous members and guests from the 24 dealerships in Nevada, visiting dealers were registered from Utah, California, Idaho, and Oregon.

Speakers at the convention sessions included Wilton Jackson, Northwest Fabricators; A. D. Roberson, E. H. Schneider Inc.; Joseph Hill, Promostat Inc.; Fire Chief Elmer Gates, Las Vegas; Carl Abell, BUTANE-PROPANE News.

The new meter prover operated by the Nevada department of weights and measures was given a special showing for the dealers.

Social events included a friendship hour, dinner dance and floor show (including Lili St. Cyr) and a conducted caravan to Boulder dam.

Officers elected at the convention include John Verbaal, Sparks, president; Ernie Gile, Panaca, vice president; Robert Marold, Las Vegas, secretary-treasurer. Directors include Otis Rife, Glenn Breuner, William Walker and George Meyers.

Officers, speakers, and official visitors at Nevada Liquefied Gas Dealers' Association convention are, left to right: Bob Marold, secretary-treasurer; Carl Abell; George T. Meyers, outgoing president; C. Roland Usher, vice president, Western Liquid Gas Association; A. D. Roberson, E. H. Schneider Inc.; Joe Hill, Promostat; (seated) Dominick Campora, president, Western Liquid Gas Association; Charles Cavanaugh, outgoing secretary-treasurer; George W. Requa, executive secretary, Western Liquid Gas Association.



Officers and directors of the Kansas LPG Association include, front row, left to right: Ralph Dickey, Dickey Appliance, Medicine Lodge; Clyde Cheatum, Coleman Gas Service, Wichita; Harold J. Stanton, Stanton L.P. gas Service, Morrowville; A. C. Ferrell, A. C. Ferrell Butane Gas Co., Atchison. **Back row, left to right:** A. J. Burke, Farmers' Butane Service, Hutchinson; Jim Emmons, Butane Gas Delivery, Pauline; Francis R. Jensen, At-Kans Supply, Atwood; Glen O. McGuire, Union L.P. gas, Iola.

Kansas LPG Association Elects Jensen President

Delegates attending the Kansas L. P. gas Association convention held in Wichita recently selected the following officers to guide policies of the organization for next year: Francis R. Jensen, At-Kans. Supply, Atwood, was elected president. Dick Dougherty, Mid-Continent Butane, Great Bend was elected vice-president; and Ralph Dickey, Dickey Appliance, Medicine Lodge, secretary-treasurer.

Directors elected include: Jim Emmons, Pauline, director at large; Francis Hoover, Minneapolis, District 3; Ralph Dickey, Medicine Lodge, District 6; Walter Unruh, Montezuma, District 8.

Clyde Cheatum, Coleman Gas Service Co., Wichita, chairman of the group, presided at all meetings.

H. C. Ferrell, first vice president, LPG Association, was called upon to outline the year's progress of the national association. In a talk on "Looking Ahead with LPG Association" Rudy Mahnke discussed some of the new markets opening up for L. P. gas, at the same time discussing plans for capturing a greater portion of potential load. At another session Mr. Mahnke addressed producers and suppliers attending the convention.

Glenn McGuire, chairman of district meetings, outlined plans for future meetings of the districts of the

state. Carroll E. Coleman, district secretary of the group, brought the report of the legislative committee.

Francis Jensen, chairman of the educational and safety committee, presented a safety award to Walter Larson of Butane Gas Co., Pauline. Mr. Larson had driven 3440 consecutive days without an accident. Twenty four additional safety awards were given to other drivers at district meetings held in November. The awards are made for long hours of safe driving.

Everett Christensen, Modern L. P. gas Service, introduced Dan Comp-ton, manager of Kansas Security Agency, Wichita, who presented plans for a group insurance program. Lee Laptad brought the report of the nominating committee.

E. E. Evans, Standard Oil Co., in a talk entitled "The Magic Barrel," discussed many of the new miracle products evolving from petroleum products.

In a talk entitled "A Picture Is Worth 10,000 Words" H. A. Goodwin, Bastian-Blessing Co., discussed man-method and material failure in connection with producing accidents. Slides were shown to illustrate the talk.

B. J. Smith and R. B. Stevens of Harper-Wyman Co., presented a cooking demonstration to show the superiority of gas over electricity.

Program for the ladies included shopping tours, a Bingo game and a ladies' luncheon.

Delmarva Elects Maurice Peacock

A recent meeting of the Delmarva Gas Association at the Wiconico hotel in Salisbury, Md., saw the election of Maurice L. Peacock of Snow Hill as president. Howard Dorey of Millsboro is the retiring president.

Other new officers include Fields Hash, Easton, vice president; David Stavely, Easton, secretary; and Ralph

NOW—from **SUNBEAM** by American-Standard

a new line
of compact, utility units
installation tested*

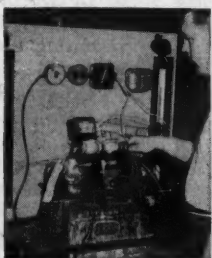
to save you time
and money

With the New Wyandotte, Sunbeam brings you a complete line of compact, gas utility winter air conditioners. This ultramodern line offers famous Sunbeam quality... competitively priced for high-volume sales. And every unit is *installation tested* to assure easy and immediate operation upon installation... continuous operation without unnecessary call-backs.

* The "installation test" is only one part of Sunbeam's famous 4-point testing program that includes:



Testing of heating elements under 4 to 6 pounds of air pressure.



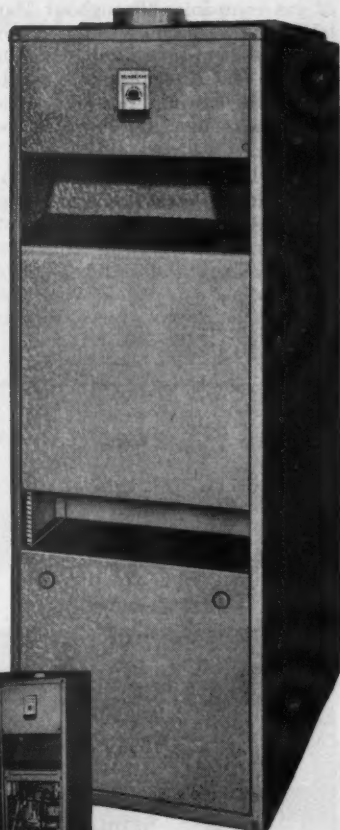
Testing of gas manifolds under 4 to 6 pounds of air pressure.



Factory operation of automatic pilot valves and quiet-action gas valves.



And finally "Installation Testing" after factory assembly of unit.



THE NEW WYANDOTTE (Model GUA) — industry's most thoroughly tested winter air conditioner — is an all-new design. Slender, modern and efficient units come in sizes to meet every requirement for utility room or closet installation.

This 4-point inspection adds up to the industry's most thorough test. Each unit is given a final testing *after* it is completely assembled, including fire testing and operation of blower and controls.

Ideal for both new homes and modernization jobs, the New Wyandotte comes in 7 narrow sizes. Smallest size is only 13 $\frac{1}{8}$ " wide! 200,000 B.T.U. size, completely assembled, fits through an average door! It's factory-assembled and completely wired, including all controls. Blower is mounted

to slide out like a drawer. All servicing and cleaning can be done from the front.

THE NEW WYANDOTTE fits every requirement you have for a gas-fired utility-type winter air conditioner. Get complete information about this ultramodern line from your Sunbeam distributor. He is listed under "Furnaces" or "Air Conditioning Equipment" in the Yellow Pages of your phone book. **SUNBEAM AIR CONDITIONER DIVISION**, American Radiator and Standard Sanitary Corporation, Elyria, Ohio.



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SUNBEAM AIR CONDITIONER DIVISION
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Executive Offices: 40 W. 40th Street, New York 18, N. Y.

Serving home and industry: AMERICAN-STANDARD • AMERICAN BLOWER • CHURCH SEATS & WALL TILE • DETROIT CONTROLS • KEWANEE BOILERS • RUSS EXCHANGERS • SUNBEAM AIR CONDITIONERS

Watson, Rehoboth Beach, treasurer.

Approximately 100 representatives of gas companies throughout Maryland, Delaware and Virginia attended the all-day meet of the association. Officers and directors were elected during the morning business session while talks took up the afternoon period.

C. T. Burg of Cleveland put on a skit titled "Beware of the Bogey Man," pointing out that pessimistic salesmen are no good to any organization. C. A. Studdiford of New Jersey explained safe installations, while Thomas C. Young traced distribu-

tion from the supplier to the distributor. Sol Wiell brought out 10 selling points necessary for a good salesman.

Civil Defense Subject Of White Talk

The part that the L. P. gas industry will play in the event of a national disaster was the subject of a talk by Howard D. White, executive vice president of LPGA, before the Wisconsin LPGA meet held recently at Dell View hotel, Wisconsin Dells.

Mr. White explained that the government was becoming increasingly

aware of the vital role the LPG industry would play in supplying fuel for emergency feeding and sterilizing purposes.

I. F. Statz, supervisor of fire prevention for the Wisconsin Industrial Commission, talked on safety, urging all L. P. gas personnel to make installations in strict accordance with the Wisconsin L. P. gas code.

At the concluding banquet President O. H. Runde was taken into the Winnabago indian tribe by Chief Yellow Thunder.

LPGA Launches "Crossroads Expedition"

LPGA Membership Chairman Edward J. Casper has announced the 1954-55 LPGA membership campaign. The project will be known as "Crossroads Expedition" and will be directed to all segments of the industry.

Committee members representing every LPGA district and a group to be known as LPGA "Minute Men" will participate in this activity. The task force of Minute Men is composed of LPGA individual members who are employees of active members, representing the supplier group of the industry.

"Crossroads Expedition" is the initial project of a long range plan to promote LPGA membership. "Crossroads Expedition" runs through April 15, 1955. Quotas have been established for all LPGA districts, and it is anticipated that 800 new members will be enrolled in LPGA through the concerted efforts of the membership team, by the time the project terminates.

Coleman Discusses Prices At GAMA Meet

The gas appliance industry must stop competing on the basis of price alone, and compete harder on the basis of quality, service and value.

That's what Sheldon Coleman, outgoing president of the Gas Appliance Manufacturers Association, told his audience in Atlantic City, the setting of several GAMA meetings.

Although GAMA did not stage its customary biennial exhibition of gas appliances and equipment in the convention hall, several important meetings were held and new officers were installed.

At the board of directors meeting Thomas T. Arden, executive vice president, Robertshaw-Fulton Controls Co., Lynwood, Calif., assumed the GAMA presidency, succeeding Mr. Coleman. W. F. Rockwell Jr., president of Rockwell Manufacturing



When you buy LP-Gas from Carter, you have the assurance of high quality and dependable service. Years of experience in producing and marketing LPG make Carter an unexcelled supplier.

THE CARTER OIL COMPANY
TULSA, OKLAHOMA

MANUFACTURERS OF THE

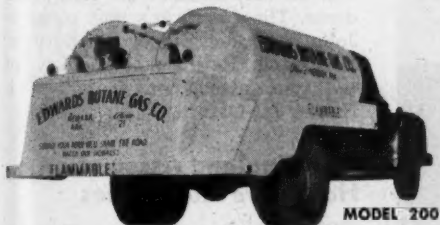
World's Finest Propane Delivery Units at LOWER PRICES

Federal Tax Paid — Easy Terms

Our trucks are in use the world over. They are perfectly balanced, weigh less, and are plumbed "right." We buy all pumps, meters, valves, hose, fittings, etc., in large quantities on a direct from factory basis and these SAVINGS ARE PASSED ON TO YOU. We maintain no expensive sales organization and our plants are located in smaller towns, all of which means SAVINGS TO YOU!

Hardly a day passes without our receiving at least one letter from a particularly satisfied customer. We get criticisms, too, but for the most part customers happily tell us we have done a good job helping them. Giving interested attention to every customer problem built our business. Tell us your problem and we will do our best to help you.

BRAND NEW 1955, 2-ton Chevrolet (Model 6403). Two-speed with 8.25 rear and 7.50 front tires, **BIG ENGINE**, Model 100 with 1400 WG twin tank. Piped complete with pump, hose, PTO, lights and paint. **ONLY \$3,895.00.**



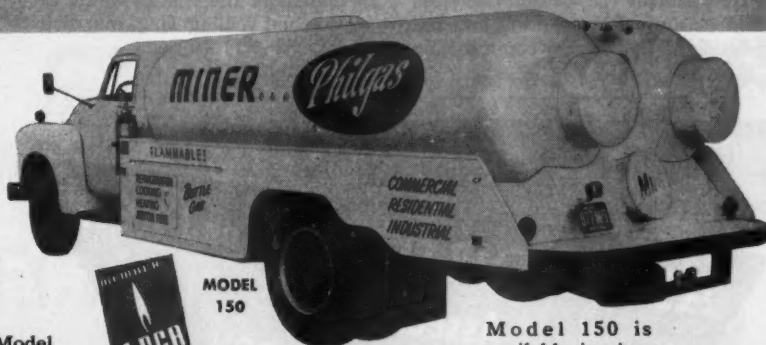
MODEL 200

MODEL 200 — 1250 to 1600 WG twin. For your safety all necessary valves, fittings, meter, reel, hose, etc., are located in the rear compartment.

MODEL 300 — 1250 to 1600 WG twin. Large rear cabinet, two large side cabinets and fully skirted.

WE REALLY SAVE YOU MONEY ON NEW TRUCKS Any make or model. Chevrolet, International (Factory equipped for propane), G.M.C., Ford and Dodge. We are new truck dealers. Get our prices before you buy.

SEVERAL GOOD USED PROPANE TRUCKS FOR SALE—IMMEDIATE DELIVERY



MODEL 150

Model 150 is available in sizes through 1800 WG, twin or single barrel.

PAY ONLY 25% DOWN

Balance in 18 months at 5% interest!



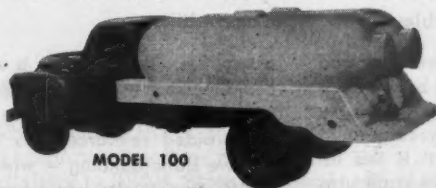
MODEL 300

MODEL 100 PACKAGE PRICES

1400 WG	1600 WG	1800 WG
\$1,765.00	\$1,875.00	\$1,975.00

Prices quoted include PTO, shaft, Viking KK-200 mechanical seal pump, 50' 3/4" filler hose, aluminum paint and lights. (Federal Tax paid.) Meters, Hose Reels, Carburation and other extras available.

Add to above prices for Model 150	\$120.00
Add to above prices for Model 200	\$150.00
Add to above prices for Model 300	\$250.00



MODEL 100



Write, Wire or Phone the Plant Nearest You

WHITE RIVER DISTRIBUTORS, INC.

Call Preston W. Grace, 570 or 686

Batesville, Arkansas

TEXAS MANUFACTURING CO.

P. O. Box 738 Gainesville, Texas (60 Miles North of Dallas) Phone Howard 5-9851

JOB COBBLER, PRES. & GEN. MGR.

Co., Pittsburgh, became first vice president, and A. B. Cameron, president of Ruud Manufacturing Co., Pittsburgh, was installed as second vice president. Lyle C. Harvey, president of Affiliated Gas Equipment Inc., Cleveland, continues as GAMA's treasurer.

Golf Highlights New Jersey Meet

New Jersey LP-Gas Association held its annual golf outing and fall meeting at Greenacres country club

in Lawrenceville, recently. Seventy-five dealers and suppliers attended the evening meeting.

Golf prizes were awarded at the dinner meeting which was presided over by President A. H. Hosbach, and highlighted by an address on "Fun, Facts and Philosophy" by Sol Weill, sales manager for Bengal ranges.

Other guests of honor were R. H. Mahnke from the national LPGA office in Chicago, A. E. Bone, East-Central district director, William Cutten, president of the Pennsylvania association and William H. Plank, district secretary.

Idaho LPGA Hosts 75 Industry Members

Nearly 75 industry members and their wives attended the recent convention of the Idaho LPGA held at Shore Lodge, McCall. According to Delmore P. Petersen, secretary, this was the largest group ever assembled for an Idaho association meeting.

Highlighting the program was the gas-vs-electricity demonstration conducted by Frank Henke, sales manager, Harper-Wyman Co., Chicago.

M. A. Ennis, IPGA West Coast secretary spoke to the assembled group following the friendship hour and dinner. President E. L. Rehkopf reported on the successful results of the recent controls schools that were conducted in Boise, Twin Falls, and Pocatello.

Pennsylvania LPGA Elects Officers

The new Pennsylvania LPGA officers will be headed by William F. Cutten, Cutten Gas Co., Wyoming. Frank Thompson, Carlisle Propane Co., Carlisle, and M. J. Board, Johnstown Suburban Gas Co., Johnstown, will be first and second vice presidents. The treasurer's post went to John W. Stoner, Stoner Gas Service, Rockwood. Re-elected secretary of the state association was Mark Haines Jr., Oxford.

New England Association Hosts Fire Authorities

The Liquefied Petroleum Gas Association of New England Inc. has completed a series of state meetings at which the state fire marshals and fire chiefs of numerous cities were guests. An important portion of the program was devoted to safety practices for prevention of LPG fires, and techniques of fighting any that do occur.

Meetings were held at Providence, R. I.; Waterbury, Conn.; Worcester, Mass.; Rutland, Vt.; Concord, N. H., and Augusta, Maine.

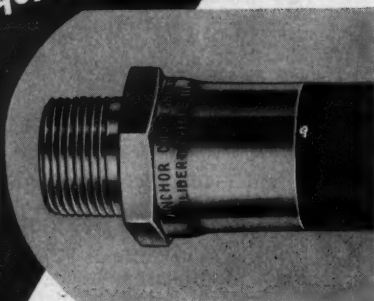
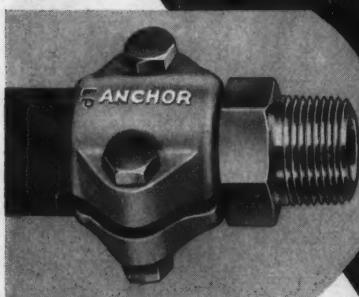
District 2 Announces Management School

The advisory committee for LPGA District 2 has announced that this district will sponsor, through its educational committee, a management school will be open to association members and non-members alike.

Jointly sponsored by the University of California, the school is tentatively scheduled for the week of June 20, 1955.

Why Experiment?

ANCHOR Styles "LP" and "LPW"
Assemblies
are designed to "LPG"
transfer requirements



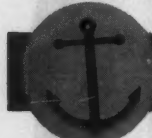
Both are available as

1. Permanent pressed-on type assemblies (or)
2. Reusable clamp type assemblies

The Anchor design, construction, and exacting method of testing before shipment is your assurance of a top quality hose assembly and consequently long, dependable service life. It is this intangible that cannot be put in pictures or words — it must be proved in service. We encourage you to put these Anchor Assemblies to test in the field under severest conditions. Only then will you know the difference between Anchor Assemblies for "LPG" use and ordinary

assemblies. The "LP" style is a 2 rayon braid, perforated rubber covered hose, with 1 multi-strand static wire between the braided reinforcements to insure positive static bonding — whereas, the "LPW" is a 1 wire braid hose with a perforated rubber cover. Anchor "LP" Assemblies provide I.D. sizes of ½", ¾", and 1" — "LPW" is available in 1¼", 1½", and 2". Give them a try — your hose troubles will be over.

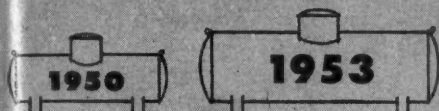
Why delay — send your order now



ANCHOR COUPLING CO., INC.

Main Office: 342 North Fourth Street, Libertyville, Illinois
Branch Offices: Plymouth, Michigan; Dallas, Texas

SALES



DEALER PROFITS



2

**Good Reasons Why
You'll Get More Out of
Selling **BS&B**
PROPANE SYSTEMS!**



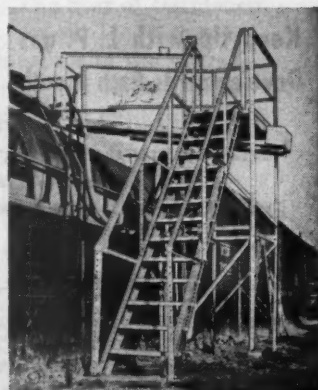
The Most Important Reasons in the world

for handling any product are simply (1) Will customers buy and be satisfied, and (2) Will it sell fast enough to make steady profits?

With Perfection Propane Systems, the answer is a big "Yes!" on both counts. Dealer sales have steadily increased to the point where we've had to *double* our production facilities. You can be sure of satisfied customers since Perfection Systems are made by a company with more than 60 years experience in designing and building pressure vessels! Stock and sell BS&B Propane Systems for city home or farm use, or for small commercial installations.

BS&B Unloading Rack

Here's another BS&B product that's sure to save money for LP Gas dealers — another reason why more dealers are switching to BS&B. Stops awkward unloading, makes walking sure and safe! New BS&B Unloading Rack reduces fire danger to a minimum ... needs only small space. Ladder or stairway located left side, right side or front as you specify. Loading rack folds out of way. Shipped knocked down, cut and marked for easy erection.

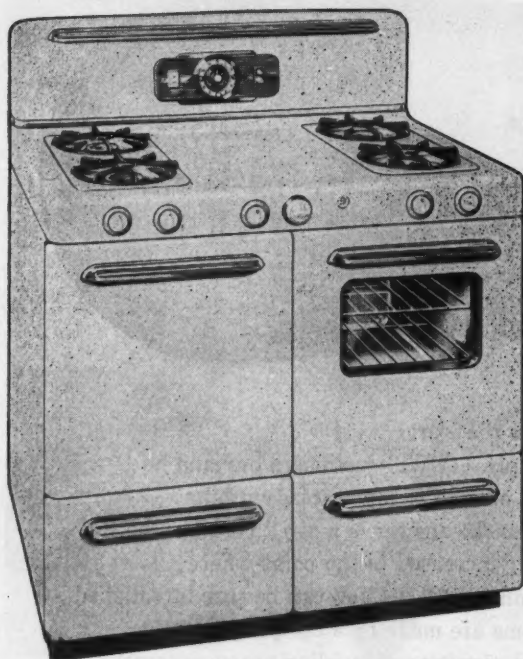


BLACK, SIVALLS & BRYSON, INC.

Propane Equipment Division Dept. 6-AB12
7500 East 12th Street Kansas City 26, Missouri

Sell most of the women
most of the time
with

Enterprise



YOU CAN'T sell all of the women all of the time, no matter what your product is. But you can sell most of the women most of the time with Enterprise gas ranges.

HERE'S WHY. Compare the features of the model shown here with those of "big name" ranges. Those "big name" ranges with identical features carry a much heavier price tag. That's why Enterprise appeals to most women most of the time.

WHAT'S IN IT FOR YOU? Profit and volume. You set your own profit margin, have plenty of latitude for trading. Volume? Yes. Because you can sell Enterprise for a price that fits every budget.

ALL YOU CAN LOSE is a three-cent stamp. Get the full story by writing:



WRITE TODAY FOR FULL INFORMATION

Serving a value-conscious America for nearly 100 years

PHILLIPS & BUTTORFF MANUFACTURING COMPANY
NASHVILLE, TENNESSEE

Keep Up with L. P. gas
Developments Each Month

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198 SOUTH ALVARADO STREET, LOS ANGELES 57, CALIFORNIA

See Page 2 for Foreign Rates

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Name _____ Title _____

Firm _____

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City _____ Zone _____ State _____

BUTANE-PROPANE
News



CALENDAR

All associations are invited to send in dates of their forthcoming meetings for this calendar.

1954

DECEMBER

Dec. 2-3—LPGA board of directors. Meeting, Hotel President, Kansas City, Mo.

Dec. 6-7—Institute of Cooking and Heating Appliance Manufacturers. Annual convention, Netherland Plaza, Cincinnati, Ohio.

Dec. 6-8—Agricultural Ammonia Institute. Fourth annual convention and trade show, Jung hotel, New Orleans.

1955

JANUARY

Jan. 22—Texas Butane Dealers Association. Mid-winter membership meeting, Austin and Driskill hotels, Austin.

Jan. 24-25—Michigan LPGA. Winter convention, Pantlind hotel, Grand Rapids.

Jan. 27—NFPA. Board of directors meeting, New York.

Jan. 27-28—Fourth Annual Instrument Short Course. Los Angeles Harbor Junior College, Wilmington, Calif.

FEBRUARY

Feb. 14-15—Indiana LPGA. Annual convention and trade show, Claypool hotel, Indianapolis.

Feb. 24-25—Eastern Canadian District LPGA. Convention, Mount Royal hotel, Montreal, Quebec, Canada.

MARCH

March 2-4—East Central District LPGA. Convention and trade show, Bellevue-Stratford hotel, Philadelphia.

APRIL

April 4-6—Southeastern District LPGA. Convention and trade show, Boca Raton hotel, Boca Raton, Fla.

April 13-15—Natural Gasoline Association of America. Annual convention, Baker and Adolphus hotel, Dallas.

April 17-19—Western Liquid Gas Association. Annual convention, Hacienda hotel, Fresno, Calif.

MAY

May 1-4—Liquefied Petroleum Gas Association. Annual convention and trade show, Conrad Hilton hotel, Chicago.

May 16-20—National Fire Protection Association. Meeting, Netherland Plaza, Cincinnati.

May 23-25—Gas Appliance Manufacturers Association. Meeting, Ambassador hotel, Los Angeles.



In a troubled world.... a Star!



The world was troubled when that star first came ... then, too, dictators in far lands oppressed those who sought the contentment of family, church and their work.

But we still have the STAR. The Star of Bethlehem ... in our city, our community. In our troubled era, may it guide us in all our relationships in the years to come. May we by prayer, thought and work come to fulfillment of Peace on Earth and Good Will to Men.

In this spirit, we wish to all a Merry Christmas and a Happy New Year. Fairbanks, Morse & Co.,
600 South Michigan Avenue, Chicago 5, Illinois.



FAIRBANKS-MORSE

a name worth remembering when you want the best

DIESEL AND DUAL FUEL ENGINES • DIESEL LOCOMOTIVES • RAIL CARS • ELECTRICAL MACHINERY
• PUMPS • SCALES • HOME WATER SERVICE EQUIPMENT • FARM MACHINERY • MAGNETOS



PETROLANE LTD. — William A. Coglizer has been appointed manager of purchases for Petrolane and its subsidiary companies, according to an announcement by P. E. Foote,

president. Mr. Coglizer will make his headquarters at the company's main office in Long Beach, Calif.

Joining Petrolane in 1951, Mr. Coglizer has served successively as assist-

ant to the president, appliance division manager, and advertising and merchandising manager.

Effective with the new appointment, Mr. Coglizer's former merchandising activities have been consolidated into the retail sales department under the direction of R. J. Munzer, vice president.

MASTER TANK & WELDING CO. — Milam P. Hare has been appointed district salesman in Houston for Master Tank & Welding Co., according to an announcement of Sam Weempe, partner in the firm.

Mr. Hare will specialize in the sale of large pressure vessels for the liquefied petroleum gas and refining industries. He will also sell the company's large diameter pipe to the gas industry.

UNIVERSAL PRODUCTS INC. — W. H. Montz has been placed in charge of the L. P. gas division of Universal Products Inc., according to an announcement of William Hungate, owner of the company, which has headquarters in Houston. He succeeds Bill Robinson, who resigned.

Mr. Montz has held the position of field engineer and serviceman for the past two years. Prior to joining the company he was for two years with K & S Butane Co., at Waco, Texas.

AKIN GASOLINE CO. — Frank P. DeLarzelere of Tulsa has been placed in charge of the liquefied petroleum gas division. The announcement was made by H. R. Johnson, president of the company.

Before entering the L. P. gas field in 1935, Mr. DeLarzelere was with a major oil company for many years.

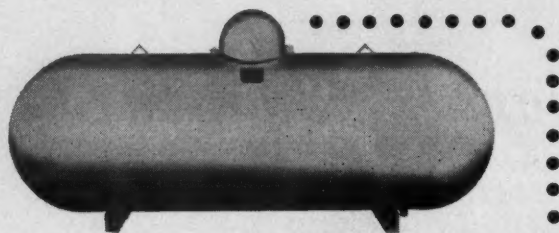


F. P. DeLarzelere

INTERNATIONAL HARVESTER CO. — Reassignment of three motor truck district managers and appointment of new managers for two of the company's district motor truck sales operations are among changes in district management personnel announced by R. M. Buzard, manager of sales, motor truck division.

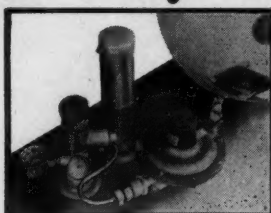
J. O. Lambeth, formerly district manager at Charlotte, N. C., was transferred, in the same capacity, to Nashville, Tenn. C. T. Helin, formerly district manager at Houston, was transferred, in the same capacity, to

TO GIVE SALES A BOOST... GIVE CUSTOMERS THE BEST!



FLINT LPG SYSTEMS

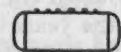
New control fittings make FLINT systems easier to install, easier to fill — Easier to Sell.



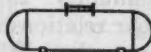
The High quality construction of FLINT tanks, plus the convenience and reliability of these new control fittings, make FLINT your best "sell" in LPG systems. Heavy angle legs have large bearing surface to prevent rocking or rolling; will not let tank skid or crawl off foundation. Every tank is built in accordance with ASME code for 250 lbs. working pressure and tested to 375 lbs. psi. — Meet all state requirements.

Six sizes, from 120 to 1,000 gallons. Bulk storage tanks in 6,000, 8,000, 10,000, 12,000, 18,000 or 30,000 gallon sizes.

Anhydrous Ammonia Tanks in the following sizes also available.



APPLICATOR TANKS
100 gal. 157 gal.
200 gal. 236 gal.
310 gal. 500 gal.



FARM SERVICE TANKS
500 gal. 1000 gal.
in 28" - 41" and
48" diameter



BULK STORAGE TANK
6000 gal.
10,000 gal.
30,000 gal.

BUILT BETTER . . . TO SELL BETTER

FLINT STEEL CORPORATION

MEMPHIS, TENNESSEE

• TULSA, OKLAHOMA

19 producing plants and storage wells...

... assuring Cities Service customers
a continuous supply of consistently
highest quality LP-Gas.

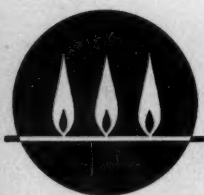
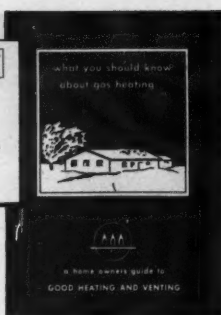


406 W. 34th Street
Kansas City, Missouri

20 No. Wacker Drive
Chicago, Illinois

500 Robert Street
St. Paul, Minnesota

6611 Euclid Avenue
Cleveland, Ohio



BUILD



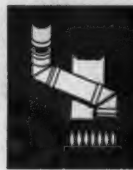
LP-GAS HEATING BUSINESS with METALBESTOS

EYE-OPENERS as your DOOR-OPENERS

Now the prestige product in the gas venting field brings to your customers, the home-owners, an informative eye-opening explanation of **what** gas heating is all about ... **why** their gas heating system should be checked ... and **who** will perform this service free (answer: their Metalbestos dealer). It's a natural for building gas heating business and here are the tools to do it:

- a 16-page illustrated booklet that convinces the home-owner of the need for a correct, up-to-date gas heating system.
- dealer newspaper ads to hammer home the importance of having gas heating systems checked.
- dealer mailing pieces that offer your customers the Metalbestos booklet and your check-up services.

Contact your nearest Metalbestos jobber today about these door-opening eye-openers — yours without charge — or write to:



METALBESTOS

DIVISION

WILLIAM WALLACE COMPANY • BELMONT, CALIF.

Member: National LP-Gas Promotional Program



Red Jet WEED CONTROL BURNER

USES LIQUID L. P. GAS —
The Most Economical
Burner Yet Designed.

- Uses Full Tank Pressure.
- Throws Flame 8 to 12 Feet.
- Flame Temperature 2500 Degrees, Plus.
- Burns 12 to 25 Gallons Per Hour.

The RED JET Has Many
Applications in Farm,
Commercial and Industrial
Uses!

- Kills All Annual Weeds.
- Kills Insects — Destroys Their Eggs.
- Prevents Reseeding.
- Decreases Labor Cost in the Fields.

Manufactured by Northwest Fabricators, NYSSA, OREGON

Charlotte. P. C. Johnson, formerly district manager at San Antonio, Texas, was transferred, in the same capacity, to Birmingham.

New district manager at Houston is J. S. Turner, who previously served as assistant district manager at Shreveport.

H. T. Rosell, formerly assistant manager at San Antonio, was named to succeed Mr. Johnson as district manager at that office.

Other appointments announced include the transfer of Hugh Hanks, formerly assistant district manager at Lincoln, Neb., to Omaha in the same capacity and the naming of J. M. Coyle, assistant district manager at Lincoln. Mr. Coyle was previously sales promotion supervisor of the Omaha district.

NORTH TEXAS TANK CO.—J. H. Brown of Keene, Texas, has been appointed sales manager for North Texas Tank of Denton, Texas, according to W. A. Barker, vice president.



J. H. Brown

Formerly district manager for the Texas - Oklahoma - New Mexico area for LPG Credit Corp., Mr. Brown is one of the Southwest's best informed experts on credit in this field. He will supervise all credit activity at North Texas Tank. His experience and knowledge of the anhydrous ammonia field will also place that particular department of the business under his direction.

Jimmy Brown began his career in the L. P. gas industry digging ditches for the automatic Gas Co. of Tyler and Sulphur Springs, over 16 years ago and eventually became a stockholder and executive of the company.

CHARLOTTE TANK CORP.—The appointment of Glyn Thomas as general manager is announced by Mark Anton, president. Mr. Thomas has been associated with the L. P. gas and steel tank industries for close to 20 years.

Charlotte Tank Corp., a subsidiary of the Suburban Propane Gas Corp., Whippany, N. J., manufactures high pressure steel cylinders and tanks for the storage and transportation of L. P. gas and anhydrous ammonia.

In making the announcement, Mr. Anton commented that Mr. Thomas had started his L. P. gas career in 1935 at the present Richfield Springs, N. Y., district office of the parent company. He comes to Charlotte from

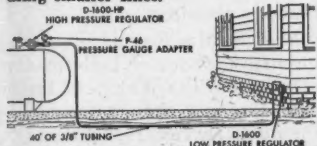
The Case Favoring Two Stage Regulation



by
GEORGE R. POSTLEWAIT
General Manager
SELWYN-PACIFIC
COMPANY

There are so many advantages to be gained from two-stage regulation that the question is not "Can I afford it?" but "Can I afford to be without it?" With the advent of new and improved SEL-PAC large capacity high pressure regulators, inexpensively priced, there are cases when it becomes more costly to use single stage regulation.

Consider these advantages with two-stage regulation: freeze-ups are greatly reduced as much larger orifices can be used than with single stage. Expansion of gas takes place at two different points with less expansion at each point and more surface area to provide heat. Much smaller lines can be used in piping from the tank to the house resulting in savings in cost of pipe, tubing and fittings plus ease of handling smaller lines.



Two-stage regulation eliminates fluctuating delivery pressures experienced in single stage regulation caused by differences in summer and winter storage tank pressures. Higher efficiency for customer as orifice pressure remains constant at 11" water column pressure. This means fewer service calls for pilot and burner adjustments due to fluctuating pressures. Furthermore, the second stage regulator can be installed inside the building which is often advantageous.

The pressure in an ordinary propane tank may vary from 225 pounds per square inch on a hot summer day to 10 or 15 pounds on a cold winter day when under a heavy load. This means that a single stage regulator may have variations in inlet pressure of 200 pounds or more. This may result in differences in delivery pressure ranging from 13 to 14" water column pressure in the summer to 8 or 9" in the winter, a fluctuation of 3 to 4 inches.

With SEL-PAC two-stage regulation the high pressure regulator acts as a shock absorber. A regulator which may be set at a delivery pressure of 10 p.s.i. may climb as high as 11 p.s.i. on a cold winter day. This means that the inlet pressure to the final stage regulator will vary only 2 or 3 pounds maximum as opposed to a variation of over 200 pounds as in the case of the single stage. Small variation in inlet pressure of only 2 to 3 pounds does not affect the outlet pressure of the second stage regulator.

Write us for the complete story of two-stage regulation. We will gladly send you charts, diagrams, tables, etc., of help to the installation and service man—no charge or obligation whatever.

SELWYN-PACIFIC COMPANY
340 West Avenue 26
Los Angeles 31, California

the Steel Cooperaage division of the Serrick Corp., where he occupied the position of assistant general manager and sales manager.

GENERAL CONTROLS CO.—General Controls has appointed John A. Wolff to the post of heating controls division sales manager at the company's headquarters in Glendale, Calif.



John A. Wolff

According to J. F. Ray, vice president in charge of sales, Mr. Wolff will coordinate all sales activity for heating and appliance controls throughout the company's 38 regional and branch offices which handle local manufacturer and other customer sales and service.

Mr. Wolff, who has been in the heating and automatic controls field for many years, goes to General Controls from Milwaukee Specialties Co., where he has been national sales manager.

FLORENCE STOVE CO. — Joseph J. Ptacin was appointed advertising manager with headquarters in Chicago, Robert Taylor, president, has announced. Mr. Ptacin was sales promotion manager of Admiral Corp.'s appliance division before joining Florence.

THE OHIO INJECTOR CO.—Harry C. Bell, a veteran of 25 years in the industrial valve field, has been named director of engineering for Ohio Injector, Wadsworth, Ohio, and A. A. Kruse Jr., formerly sales manager for the company's mid-continent division, moves to the position of chief engineer.

Mr. Bell joined the firm in 1952. His background includes experience in sales engineering, utility sales, engineering for steel plant equipment, and executive engineering positions in the construction industry.

Mr. Kruse has been with the firm since 1939. His career has taken him through the OIC engineering department and into the sales side of the business.

CITIES SERVICE OIL CO. — The oil industry acknowledged at Bartlesville recently the 65 years of service contributed by Herbert R. Straight in the petroleum field.

Mr. Straight was honored at a recognition dinner given by officers and directors of the Cities Service Oil Co. As senior oilman in the mid-continent, Mr. Straight has been called

the "Dean of Mid-Continent Petroleumists." Claim to the title is based on his more than 40 years of service in mid-continent oil circles.

He moved to Oklahoma from the Pennsylvania oil fields in 1911 to help manage the old T. N. Barnsdall properties. Shortly thereafter he joined a group of producing companies which later became Cities Service Oil Co., later becoming vice president, president and finally board chairman. On Dec. 31, 1947, he gave up active participation in company affairs as board chairman.

AMERICAN RADIATOR & STANDARD SANITARY CORP.—Daniel J. Quinn has been named vice president, sales, of the plumbing and radiator heating division, president Joseph A. Grazier has announced.

Mr. Quinn previously was general sales manager of the division. In his new position he succeeds D. D. Couch, who has been named vice president, marketing and commercial development.



D. D. Couch



D. J. Quinn

Mr. Quinn has been associated with American-Standard since 1925.

Mr. Couch previously had headed the sales department of the corporation's plumbing and radiator heating division. He joined American-Standard in 1925 as an auditor, and has been engaged in sales work since 1928. He has been vice president, sales, since 1944.

THOMAS TRUCK & CASTER CO.—Walter R. Thomas, vice president



C. P. Anderson

of sales for Thomas Truck & Caster Co., Keokuk, Iowa, announces the recent appointment of C. Parke Anderson as sales manager of Mr. Thomas' newly acquired division, the Lanham Skid Co., with offices also located in Keokuk. Mr. Anderson has been associated with Thomas since 1943 and dur-

the Steel Cooperage division of the Serrick Corp., where he occupied the position of assistant general manager and sales manager.

SURFACE COMBUSTION CORP.—The appointment of Walter R. Fresne as a sales representative in the Idaho-Utah area has been announced by H. C. Gurney, sales manager, heating and air conditioning division.

Mr. Fresne is a graduate of the University of Utah and has had a number of years' experience in selling of plumbing and heating equip-

ment, first with Western Gas Appliances Inc., Salt Lake City, and then as a manufacturer's representative.

FISHER GOVERNOR CO.—Jack M. Clark has recently transferred from the home office in Marshalltown, Iowa, to Fisher Governor Co.'s eastern sales office in Westport, Conn. He is traveling the upper states of the eastern seaboard, and otherwise assisting Walter E. Hoagland, Fisher eastern district sales manager, in the sale of LPG regulators and accessory equipment.

Mr. Clark attended Iowa State college, majoring in engineering, and joined Fisher Governor in 1946. He spent several years in the design engineering department, and was in the sales engineering department prior to his transfer to Westport.

WHIRLPOOL CORP.—Expansion of the home service department and the appointment of Marcia Mead as new home service director are announced by Merchandise Manager Roy Howard.



Marcia Mead

The enlarged department coordinates all home service activities under the direction of Miss Mead, who becomes a member of Whirlpool's merchandising staff. A woman's division will interpret women's interests in terms of laundry equipment and modern laundry planning.

Miss Mead will supervise consumer inquiries, consumer bulletins and all activities of the Whirlpool test laundry. She will also advise and assist the home service departments of the Whirlpool distributing organizations.

WHIRLPOOL CORP.—Austin Schullstrom has been appointed a regional sales manager, it is announced by national sales manager John M. Crouse. The appointment brings to 15 the total number of regional managers employed by the firm.

Mr. Schullstrom will supervise Whirlpool sales activities in Alabama, Tennessee, Arkansas, Mississippi and Louisiana.

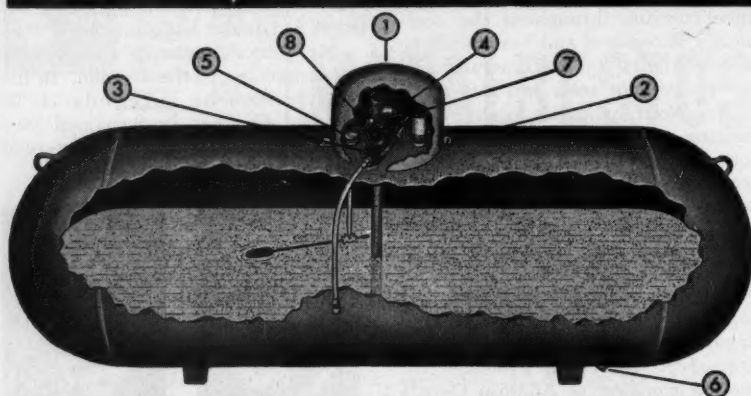
SUNBEAM AIR CONDITIONER DIVISION—The appointment of R. J. Berkshire as marketing manager and H. E. Rossell Jr. as sales manager of the Sunbeam air conditioner division of American Radiator & Standard Sanitary Corp. is announced by W. H. Baker Jr., vice president, sales.

Mr. Berkshire will supervise and coordinate activities of the advertising and sales promotion, dealer development and market research departments.

Mr. Rossell will be responsible for operations of the Sunbeam air conditioner's field sales force, consisting of representatives in 21 cities throughout the nation.

Both Mr. Berkshire and Mr. Rossell will be located in the executive offices of the Sunbeam division in the American-Standard Bldg., New York City.

Economy LP-GAS SYSTEMS



Some of the many Features and Qualities of Economy Systems

- ① ONE PIECE STREAMLINE DOME!
- ② STURDY DETACHABLE HINGE!
- ③ LARGE ORFICE REGULATOR!
- ④ LIQUID TAKE-OFF, BUILT-IN EXCESS FLOW!
- ⑤ FLOAT GAUGE, REPLACEABLE SNAP-ON DIAL!
- ⑥ BOTTOM PLUG FOR LIQUID, OR CLEAN OUT!
- ⑦ LIQUID LEVEL OUTAGE GAUGE!
- ⑧ PRESSURE GAUGE OUTLET!

SEE US BEFORE YOU BUY!

Economy Truck Tanks, Transports, Skid Tanks, Anhydrous Ammonia Tanks and all types of Steel Fabrications.

VICKSBURG TANK COMPANY, INC.

409 LEE STREET

VICKSBURG, MISS.

Introducing... **THE NEW**

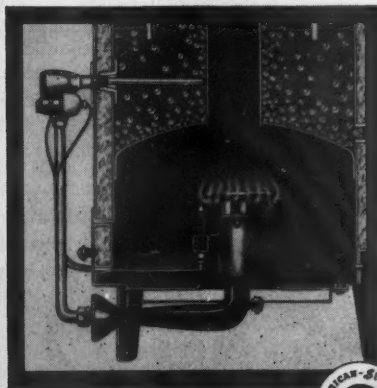
American-Standard Gas-Fired Water Heater ... for more profitable sales!

THIS new American-Standard Gas-Fired Water Heater has really got what it takes to make customers out of prospects. Available in three popular sizes—20, 30, and 40 gallons—it combines quality construction and precision engineering with moderate price and operating economy.

And all these design features . . .

- ★ new fuel-saving burner . . . burns any type of gas efficiently
- ★ fully automatic Minneapolis-Honeywell controls
- ★ rapid heating, quick hot water recovery
- ★ heavy galvanized steel tank . . . hydrostatically tested at 355 pounds
- ★ compact unit . . . takes up minimum of space
- ★ glistening, durable white baked enamel finish with gray trim
- ★ domed jacket top . . . easy to keep clean
- ★ heavy gauge steel jacket insulated with fiberglass
- ★ available with magnesium anode . . . to prolong the life of the tank

The new American-Standard Gas-Fired Water Heater can be counted upon to give years of service. This A.G.A. approved water heater undergoes rigid factory inspection and the tank, burner, safety pilot, and thermostat are factory tested to assure dependable operation.



The American-Standard Water Heater burner is designed to heat water quickly and efficiently with any type gas. This single-port, upshot-type burner holds fuel costs to a minimum by getting the most out of the fuel burned. It's quiet operating, too.



AMERICAN-Standard

American Radiator & Standard Sanitary Corporation, P. O. Box 1226, Pittsburgh 30, Pa.

Serving home and industry: AMERICAN-STANDARD • AMERICAN BLOWER • CHURCH SEATS & WALL TILE • DETROIT CONTROLS • KEWAUNEE BOILERS • ROSS EXCHANGERS • SUNBEAM AIR CONDITIONERS

Butane-Propane News

AGA-GAMA Publish Gas Appliance Manual

The joint American Gas Association-Gas Appliance Manufacturers Association committee on gas appliance service manuals has prepared a new manual.

Published in September and brought up to date to include the latest in controls for the servicing of clothes dryers, ranges and water heaters, the manual is a useful and necessary tool for the gas appliance serviceman.

The manual may be kept up to date by subscribing to supplementary service pages. A three-year subscription includes eight issues.

First Students Enrolled Under New Loan Program

The first two students to enter Southern Technical Institute for L. P. gas training under the new student loan program set up at the 1954 LPGA convention are now in attendance. They are Stanley A. Budzinski, 20, of Nanticoke, Pa., and Fred O. Sumner, of Como, N. C.

The gas fuel technology loan fund is now available to help in the education of any young man or woman who is interested in a career in the L. P. gas industry, who meets the entrance qualifications of Southern Technical

Institute, and who lacks the funds from other sources to defray the complete cost of the gas fuel technology course.

Funds available at this time include the \$10,000 raised at the 1954 LPGA convention through the pledge of Peter A. Anderson to provide \$5000 if the rest of the industry would pledge an equal amount. To this has been added \$344 contributed by Selwyn-Pacific Co. from the sale of vaporization and pipe sizing calculators issued by that company, and \$246 contributed by the Kentucky LPGA. This money was raised by adding \$1 to the registration fee at the recent association convention.

The committee on the Gas Fuel Technology Foundation considers that the minimum amount required in the student loan fund to meet the need for technical training in the industry is between \$50,000 and \$60,000.

NHDAA Sees LPG Industry Show

More than 400 members of the National Home Demonstration Agents' Association saw a special two-hour L. P. gas industry show at their annual convention. Staged as the main event on the final morning of the meeting, the program was complete with range displays, resume of latest news about domestic applications, and was climaxed with a "gas vs electricity" cooking demonstration.

The home demonstration agents, farm homemaker counselors who work with adult and 4-H rural groups, held their annual convention at the



Home demonstration agents let Chef Bissell Smith taste steak he broiled for them during an L. P. gas cooking demonstration at the National Home Demonstration Agents' Association convention at the Sherman hotel in Chicago.

Sherman hotel in Chicago. The industry show was sponsored by the LP-Gas Information Service.

Grant C. Haas, sales manager, Rapid Thermogas Co., Des Moines, briefed the agents on consumer benefits of all domestic applications ranging from air conditioning to incineration. Bissell Smith and Roger Stevens, Harper-Wyman Co., followed with an hour-long cooking demonstration. George J. Schulte Jr., assistant director, LP-Gas Information Service, handled arrangements for the program.

On their return home, the official delegates will report activities at the convention to more than 3000 home demonstration agents in the local groups they represent throughout the country.

FCDA, Army Hold Two Service Schools

Two food service schools, sponsored by the Army in conjunction with the Federal Civil Defense Administration, were held recently. Classes were held at Fort Dix, N. J., and Fort Meade, Md.

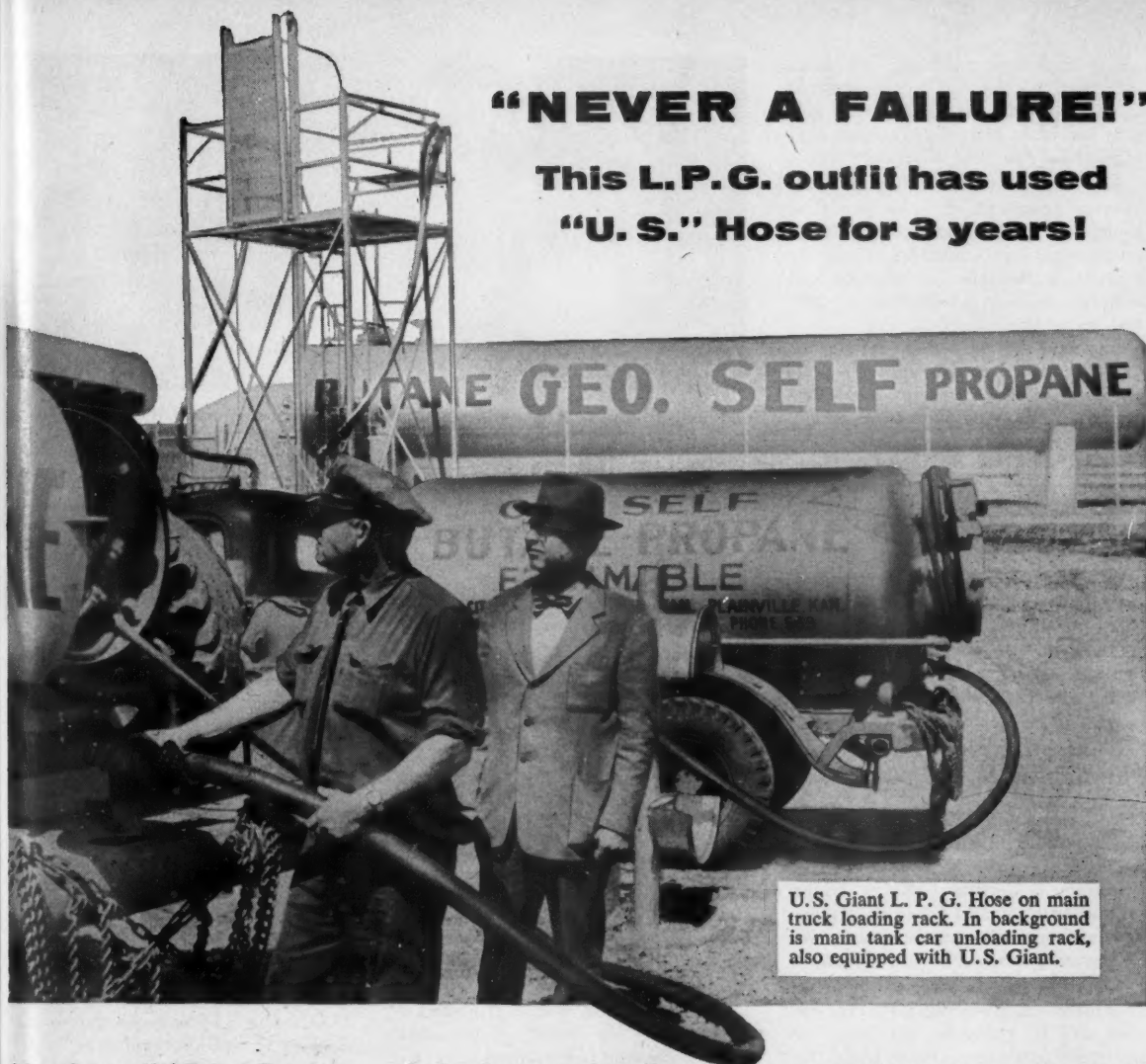
According to L. A. Katz, regional manager of Suburban Propane Gas Corp., Whippany, N. J., who spoke at the Fort Dix school, the L. P. gas industry is ready to supply emergency gas service to hospitals, institutions, schools and restaurants in case of the disruption of city gas serv-

George R. Postlewait (left) of Selwyn-Pacific Co. and Elmer Roll, (right) director, Kentucky LPGA, present student loan fund checks to M. L. Trotter (center), post president of LPGA.



"NEVER A FAILURE!"

This L.P.G. outfit has used
"U. S." Hose for 3 years!



U.S. Giant L. P. G. Hose on main truck loading rack. In background is main tank car unloading rack, also equipped with U.S. Giant.

Used on all 12 trucks—on main tank car unloading rack—on main truck loading rack

The George Self Butane Company of Ponca City, Okla., says that the U. S. Giant® L. P. G. Hose never seems to wear out. Despite brutal use day in and day out for 3 years and more, every U.S. Giant Hose on all 12 trucks, as well as on racks, is still delivering good service.

A special lightweight quality yarn construction gives U.S. Giant extreme flexibility with great strength. The tube is specially compounded to resist L.P.G.'s permeating action. A specially-designed cover eliminates blistering. There is a complete size range from 1" to 3" with burst pressures far above safety standards of any state. U.S. Giant L. P. G. Hose is obtainable from any of our selected distributors, or any of the 27 "U.S." District Sales Offices, or write address below.

"U.S." Research perfects it...

"U.S." Production builds it...

U.S. Industry depends on it



UNITED STATES RUBBER COMPANY
MECHANICAL GOODS DIVISION • ROCKEFELLER CENTER, NEW YORK 20, N. Y.

Base • Bolting • Expansion Joints • Rubber-to-metal Products • Oil Field Specialties • Plastic Pipe and Fittings • Grinding Wheels • Packings • Tapes
Molded and Extruded Rubber and Plastic Products • Protective Linings and Coatings • Conductive Rubber • Adhesives • Roll Coverings • Mats and Matting

DECEMBER, 1954

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ice from enemy bombing. Mr. Katz outlined the general availability of LPG, methods of distribution, and number of trained personnel who stand ready in case of emergency.

In a statement at Fort Meade, Mark Anton, president of Suburban Propane, said that federal civil defense officials have recognized L. P. gas as a portable, flexible and efficient fuel which is readily available to all critical target areas.

Lectures and demonstrations were given at the schools on subjects such as field sanitation, prevention of food contamination and poisoning, emergency water purification, adaptation of household and commercial stoves to the use of LPG, preparation of meals, mass feeding and other pertinent problems.

Mark Anton, who has been named chairman of the committee on national affairs of the LPGA, says that this committee has and will continue to help to develop plans for mass feeding, emergency hospitalization, first aid stations and other needs.

\$20 Million Pipeline Planned by Winnipeg

Delivery of liquid propane in Winnipeg possibly before natural gas comes from Alberta is planned by Winnipeg & Central Gas Co. Plans for construction of a \$20 million pipeline network were announced by W. F. Davey, president of the company.

When financing and engineering arrangements are completed, application will be made to the board of transport commissioners to build the line across provincial boundaries.

The propane will be integrated into the company's over-all gas system and will help considerably to widen its scope of operations. The propane network will be an auxiliary for natural gas requirements during the winter when domestic demands run nearly double that of summer months.



Shipment of 70,000-gal. pressure storage vessels, manufactured by J. B. Baird Co., Shreveport, await border clearance at Brownsville before traveling to Reynosa, Mexico. Each tank, part of an order of 41 similar storage vessels, requires three railroad flatcars to move.



Work on the first 326-mile section of the pipeline is planned to start next spring. This will take the line from Winnipeg to Tioga, N. D., nearly due south of Estevan, Sask. This will cost an estimated \$5 million.

The \$15 million balance of the estimated expenditure will be for construction to points further west, eventually to the Alberta oil fields, the exact contact points for supplies not yet certain. At Tioga in the North Dakota oil producing area of the Williston basin there are available supplies of wet gas, propane and butane, adequate for initial requirements. It is expected it will take five years to complete the whole line.

Central Florida Gas Has New Headquarters

Central Florida Gas & Appliance Co. recently moved to new headquarters in Gainesville, Fla. The move to the new location was considered a milestone in the history of the company, according to Horace Arrington, owner.

Central Florida Gas & Appliance Co. began in Trenton, Fla., in 1947. In 1950 the company was established as a Pyrofax gas distributor and had approximately 1000 customers. By 1952 Mr. Arrington had added 1236 new customers and 1953 saw the addition of 3700 more.

Mr. Arrington has located his new

New headquarters of the Central Florida Gas & Appliance Co. in Gainesville, Fla. The contemporary building has abundant display space for appliances.

headquarters far enough from the center of Gainesville to afford easy parking and yet close enough to be reached on foot from the center of town. The new store has a great deal of display space and large windows facing the street.

Rockwell to Build New Kentucky Plant

Rockwell Manufacturing Co. announced recently the selection of Russellville, Ky., as the site for a new plant expected to be in operation in mid-1955.

The plant will be located on a 30-acre site, according to Campbell Stuckeman, vice president. It will have from 80,000 to 100,000 sq ft of floor space and is expected to cost close to \$1 million, exclusive of production equipment. Construction will start in early January and initial occupancy is scheduled for May.

Chemical Enterprises Acquires McCall Plants

Chemical Enterprises Inc., New York, has acquired nine anhydrous ammonia and farm chemical distributing companies from W. C. McCall of Portland, Ore. The companies include facilities for converting AA to aqua ammonia.

Mr. McCall, a director of the Agricultural Ammonia Institute and a distributor of petroleum products, will continue to serve as a director and president of the companies.

Chemical Enterprises Inc. also maintains subsidiaries in the field as separate companies. These include Columbia Ammonia, Palouse Ammonia and Whitman Ammonia Companies.

Through the affiliation with Chemical Enterprises, the McCall com-



DON'T WORRY... NO BURNS

OR

BLISTERS

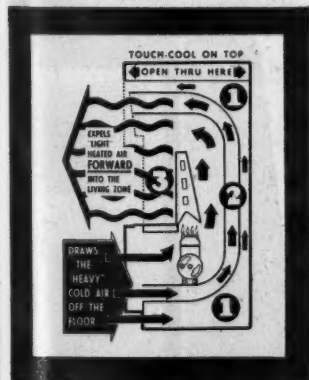
HERE!



Because it's touch cool top and sides! It's Temco's Air Flow Reflector Heater. Completely new! The only unvented heater to use the revolutionary Air-Flow Reflector Principle!

THE COOL CABINET SELLS YOUR CUSTOMERS! AND THESE BONUS FEATURES KEEP THEM SOLD:

- Combines the advantages of radiant and circulating heaters to give faster heat distribution.
- "Lifetime" Porcelain Enamel finish.
- Striking new beauty of design enhanced by bright metal hearth and side reflectors.
- Blue Flame operation on all gases, thanks to the high crown of the drill port cast iron burner.
- Built by Temco—America's Gas Heat Specialists.
- Backed by comprehensive national advertising.
- Priced within the budget range of every family.



TEMCO, INC.

NASHVILLE, TENNESSEE

*Builder of over
1 1/2 million gas appliances*

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Nashville, Tennessee

Please send me catalog and complete story on
TEMCO Gas Wall Heaters.

Name.....

Firm Name.....

Address.....

City..... Zone..... State.....



The Northern Gas Board of Newcastle, England, has provided window shoppers with outdoor gas-fired radiant heaters to provide warmth for persons looking at the company's displays in showroom windows during cold weather. Four heaters were installed at approximately 11 ft above the pavement.

panies will be able to expand their distribution of AA and aqua ammonia into new areas. Chemical Enterprises benefits through a balance in its activities; the firm distributes various farm supplies.

Texas Natural Reports Increase in Income

Texas Natural Gasoline Corp. announced at its recent annual stockholders meeting that its consolidated net income for the fiscal year, ended Aug. 31, was \$1,240,154. This is an increase over fiscal year 1953.

Major expenditures completed by Texas Natural during this fiscal year 1954 included the purchase of a controlling interest in the Green's Fuel group of companies in Sarasota, Fla.; addition of 350 high pressure tank cars to the company's tank car fleet; completion of a major part of its Mont Belvieu underground storage terminal; and completion of major additions to its Rankin plant.

Company officers elected at the meeting include J. T. Oxley, president; C. W. Guy, vice president; C. H. Perry, secretary; R. M. Guest, treasurer and assistant secretary; L. A. Stuewer, assistant secretary; and J. Pfeifer, assistant secretary.

Standard Oil, Sinclair To Build Indiana Plant

Standard Oil Co. of Indiana and Sinclair Refining Co. have announced plans for one of the Midwest's largest ammonia plants. The project will be built in Hammond, Ind., near Standard's Whiting refinery and Sinclair's East Chicago refinery.

The plant will be the largest in the country producing AA from by-product hydrogen. Production capacity of the plant will be 300 tons a day of AA. The new plant is expected to be completed early in 1956.

Salesmen Training Course Offered at USC

A training course for gas appliance salesmen is being offered by the University of Southern California during the fall-winter term in a business education program designed to sharpen both old and new selling techniques.

Testing and training in the applied psychology of salesmanship as well as instruction in product and appliance manufacture and installation will be included in the course. USC joins with the Pacific Coast Gas Association in presenting the course.

5 Reasons WHY BETTER DEALERS EVERYWHERE

SELL THE NEW *NarrowWall*

EASY INSTALLATION

...in any 2x4 stud wall in new or present homes.

MORE WARM AIR

...at no extra cost with the famous Holly Secondary Heat Exchanger (Pat. 2602441).

'54 AGA APPROVAL

...with full rating on L.P. or Natural Gas.

NEW BURNER

...tested at factory under full operating conditions before shipment.

NO CALL-BACKS

...that eat into profits, because of Holly quality, design and production methods.

MORE PROFIT FOR '54

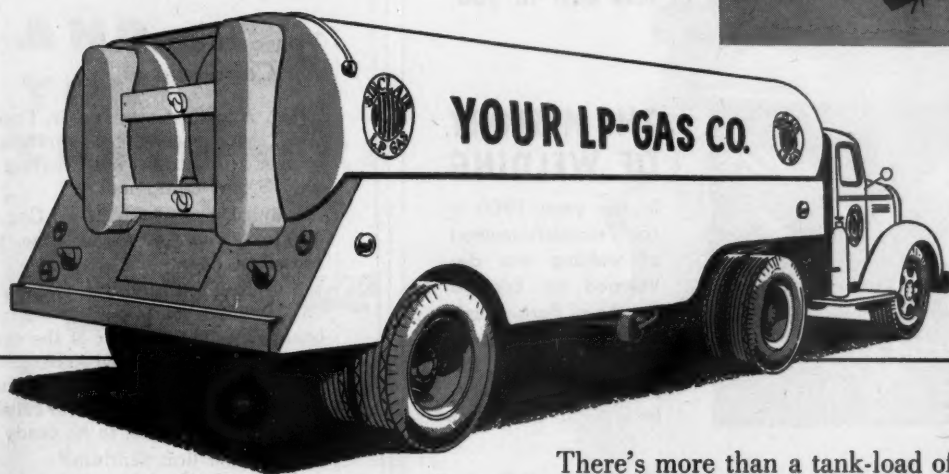
Write for complete dealer facts today.

HOLLY MANUFACTURING COMPANY

917 S. Arroyo Parkway, Pasadena 2, California

You'll be happy with **holly**

**"THE
SINCLAIR 'BONUS'
HELPS MY BUSINESS"**



There's more than a tank-load of LP-Gas in that truck! Backing you—and your customers is a bonus of 5 Sinclair extras—**INTEGRITY, REPUTATION, RESPONSIBILITY, PERFORMANCE and GOOD SERVICE.** These important extras add up to more and more satisfied, repeat customers—and a faster-growing, more profitable business for you.

Take advantage of the Sinclair BONUS. Find out about this top quality LP-Gas with high heating values—with moisture and impurities removed. It will pay you to investigate soon.

SINCLAIR-A GREAT NAME IN OIL

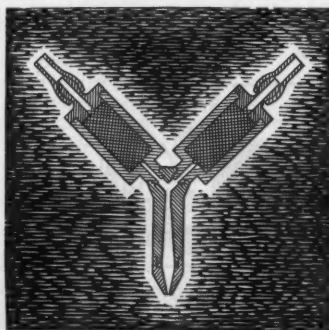
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THE STANDARD of WELDERS SINCE 1918!



Welders throughout the world have accepted Weldit welding equipment as a standard of quality for over 35 years. Weldit equipment will do a better job faster and at less cost to you. When it's Weldit, it's welded!

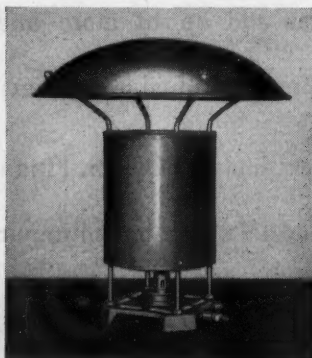


THE HISTORY OF WELDING

In the year 1900 a fairly successful method of welding was developed by Edmond Fouche of Paris. In collaboration with Picard, he invented the first practical oxy-acetylene torch illustrated.

THE *Weldit* HEATERAMA SALAMANDER

The new Weldit L-P Portable Heaterama Salamander. Gives high heat at low cost. No priming or pumping, no smoke or soot, positive control, fast, portable and rugged. Priced right and available in either Tank Top or Floor Models. Write for complete technical information.



Canadian Distributor: Alloy Metal Sales, 181 Fleet St., E., Toronto 5, Ontario, Canada.

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Gulf Chemical Co. To Make and Sell AA

United Gas Corp. of Shreveport and its parent company, Electric Bond & Share Co., are preparing to enter the petrochemical field with a new company, to be called Gulf Chemical Co. Under the plan, Gulf Chemical will build a plant near Pensacola, Fla.

The company will make and sell industrial and agricultural chemicals. The new plant is expected to have a daily capacity of 200 tons of anhydrous ammonia and 40 tons of polyvinyl chloride. Ammonia facilities are expected to be in operation by Jan., 1956.

Tucson Cathedral Air Conditioned

San Agustin Cathedral in Tucson, Ariz., was recently air-conditioned by Hearn Plumbing and Heating Co. with Servel equipment.

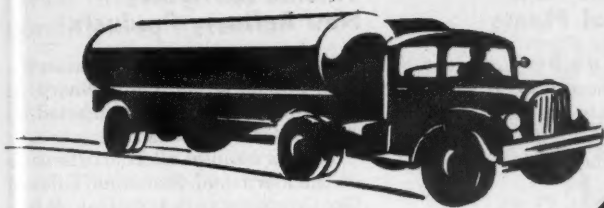
Ralph Kerns of the Hearn Co., and Monte Weaver of Servel, Inc. presented the plan.

The bishop was willing to have the cathedral air conditioned, but with conditions. The interior of the cathedral must not be visibly changed in any way. The installation must make no noise. The work must be finished within seven weeks, to be ready for a consecration.

The job started from scratch. Return-air passages replaced the four floor furnaces. Under each pew a 3-in. round pipe was thrust from an air supply chamber. There were 10 supply pipes in the sanctuary, and two



Air conditioning was recently installed in San Agustin cathedral in Tucson, Ariz.



BETWEEN YOU AND YOUR CUSTOMERS

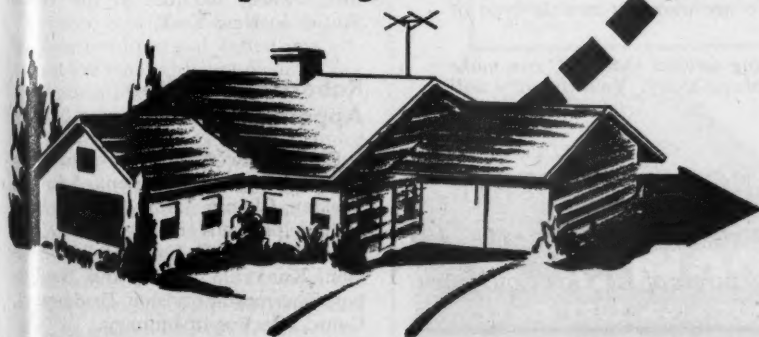
Sprague

COMBINATION METER and REGULATOR

Establish and hold good customer relations by standardizing your metered system with the Sprague Combination Meter and Regulator. Combining modern styling in keeping with today's trend toward streamlined design and accuracy that gives the home-owner complete confidence in your service, this meter brings savings to you through fewer service calls, ease in mounting and a simple actuating design that allows proving by even the smallest of shops.



THE *Sprague* METER COMPANY



MAIN OFFICE and PLANT
**BRIDGEPORT,
CONNECTICUT**

BRANCH OFFICES
DAVENPORT, IOWA
HOUSTON, TEXAS
LOS ANGELES, CALIF.
SAN FRANCISCO, CALIF.

air handling units in the choir loft.

In a small building, which had been used for storage, two gas-fired steam boilers, two 25-ton Servel DUT water chillers, two condensate pumps and a circulating pump were installed. The chilled water was conveyed into coils in the 12 supply chambers inside the cathedral, and air was blown over the coils to carry the coolness throughout the cathedral.

The installation was finished two days before the consecration. It brought the temperature down immediately from 101°—the reading outside—to the low seventies.

Plan Forty-one New Petrochemical Plants

According to a survey conducted by *Petroleum Processing*, 41 new petrochemical plants are currently being planned or built in the United States and Canada, and 269 plants are in operation.

The 41 new plants represent an estimated investment of nearly \$555 million. Thirty-four expansion projects at petrochemical plants, planned or under way, represent \$175 million of new capital outlay.

Tuloma to Market New Refinery Products

L. P. gas products produced in the new Standard Oil Co. refinery at Mandan, N. D., will be marketed by Tuloma Gas Products Co.

Tuloma handles all L. P. gas sales of Standard and Stanolind Oil and Gas Co., Standard's principal oil-producing subsidiary.

U. S. Steel to Construct Utah AA Plant

United States Steel Corp. will construct a \$20 million anhydrous ammonia plant at Geneva, Utah, beginning early in 1955. It is estimated that the plant, to have an output of 70,000 tons of ammonia annually, will be ready for operation in 1956.

The Chemical Plants division of Blaw-Knox Co., Pittsburgh, announced the construction plans. Blaw-Knox is handling the engineering and construction contract for the plant.

Blaw-Knox said the new ammonia plant will be the largest of its type in the United States. Coke oven gas from the Geneva steel plant will be used as the source of hydrogen in ammonia production.

The new plant will produce AA and ammonium nitrate for the industrial and agricultural markets in the Mountain, West and Pacific Northwest areas.

Utility, Suburban Win Industry Oscars

Utility Appliance Corp., Los Angeles, and Suburban Gas Corp., New Jersey, both won a bronze "Oscar of Industry" in the "Financial World" survey of annual reports.

For the third consecutive year Utility Appliance won first place in the household appliance industry division. Suburban Propane was judged as having the best annual report of the L. P. gas industry.

Awards were presented at the annual awards banquet at the Hotel Statler in New York.

Robertshaw-Fulton Appoints New Agency

Robertshaw-Fulton Controls Co. announced the appointment of Arndt, Preston, Chapin, Lamb & Keen Inc., Philadelphia advertising agency, for products of its Fulton Sylphon division, Knoxville, Tenn., and Bridgeport Thermostat division, Bridgeport, Conn., effective in January.

WHY HOLD BACK YOUR SALES OPPORTUNITIES?

*FAC installment sales financing
can help you move ahead if you are
a manufacturer of LP gas equipment*

If you are a vigorously competing manufacturer in the LP gas equipment industry, there is no need for you to be held back for want of an installment selling program.

First Acceptance Corporation can help you reach more prospects and sell more of your product with an installment sales program tailored to meet your special needs. Our plan will also enable you to meet the increasing demands of your present customers.

Do you manufacture the following equipment?

Cylinders • LPG domestic systems • Bulk
storage tanks • Trailer transports • Truck
transports • Anhydrous ammonia equipment

If you do, then FAC's facilities can help you.

First Acceptance Corporation operates nationally and is thoroughly familiar with industry problems. We are pioneers in this type of installment financing.

For a complete proposal of the financing services that FAC can make available to you, please write or telephone today. Your inquiry will receive prompt attention.



FIRST ACCEPTANCE CORPORATION

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Discount Bankers Serving Manufacturers of LP Gas Equipment

Sarvel Invests in Air Conditioning Research

Several hundred thousand dollars have been allocated by A. O. Smith for research in the direction of a new type of gas-fired air conditioning, according to a report issued by the company. The ultimate cost of this research project cannot be accurately predicted at the present time.

The report was compiled at the request of F. S. Cornell, vice president and general manager.

Norge Dealers Plan Toy Parade

Norge dealers throughout the country will stage toy parades in their stores this Christmas season. An assortment of 10 toys, ranging from a bicycle to a blackboard, will be offered with each Norge major appliance purchased before Dec. 25.

"The promotion will solve the traditional problem of merchandising big ticket items during the Christmas season," R. C. Connell, vice president of sales, declared. "Ordinarily appliance dealers miss the major share of the Christmas budget which is spent on children."

LPGA Revises Spacing Diagram

LPGA's spacing diagram showing clearances in compliance with NFPA Pamphlet No. 58 has been revised to incorporate new distances and rules specified in the 1954 edition.

All members holding manuals will receive one copy for insertion in the manual as per LPGA policy. Additional copies of the diagram may be obtained by writing to the Chicago office.

Prices are 1-9 copies, 10 cents each; 10-49 copies, 8 cents each; 50-100 copies, 6 cents each; over 100 copies, 4 cents each.

ICC-Type Ammonia Tanks Grow in Popularity

Pressed Steel Tank Co. reports that leading producers of anhydrous ammonia are standardizing on ammonia transportation tanks that meet ICC-MC330 specifications, and the ICC-type of mobile tank is becoming more and more popular for over-the-road transportation among other representative companies in the ammonia industry.

ICC-type tanks are designed and manufactured to comply with the ASME code for 265-lb working pressure, as well as ICC-MC330 specifica-

Stock the Brooder that sells itself!



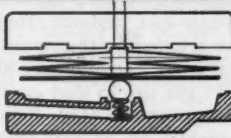

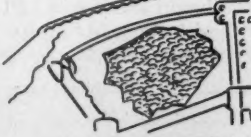

A. R. WOOD RADIANT GAS BROODER with 26% more space!

That's right folks, the A. R. Wood 500 chick brooder has a 76 inch canopy... which gives 26% more usable space than most competitive makes. The A. R. Wood 1000 chick brooder, with a 99 inch canopy, has 18% more space than most other brooders.

The benefit to your customer is more room for his chicks. More room means less crowding... lower mortality, heavier weights, greater profit to him; greater satisfaction with you—his supplier!

For 27 years, the A. R. Wood Manufacturing Co. has pioneered new developments in the poultry industry. Widely imitated, but never equaled, the A. R. Wood radiant gas brooder is exceedingly well-made and has become the best selling brooder among experienced poultrymen from coast to coast!

These exclusive features make A. R. Wood brooders the most dependable and economical on the market:

 <p>PRECISION THERMOSTAT insures constant temperature even in coldest weather.</p>	 <p>ALUMINUM BURNERS light from one pilot, are easy to remove, easy to clean.</p>
 <p>FIBERGLAS INSULATION retains heat better; reduces operating costs.</p>	 <p>PILOT TIPS of non-corrosive, non-clogging stainless steel.</p>



For complete details mail coupon today.

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SANTA CRUZ, CALIFORNIA · LUVERNE, MINNESOTA

A. R. WOOD MFG. CO.
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Please send me more information on the A. R. Wood Radiant Gas Brooder.

Name _____
Address _____
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NOW—PROMPT DELIVERY OF BURNHAM PROPANE SYSTEMS

*In Burnham
Trailers*



This quicker, more dependable delivery avoids expensive handling at destination. It eliminates the possibility of transit delays or possible damage associated with other type shipments.

The superior quality of Burnham engineered tanks plus the economy of truck deliveries direct from the factory gives you an opportunity to save that's well worth your consideration. Why not take advantage of it?

BURNHAM LPG TANKS

Available for immediate shipment — 15 sizes — either top or end mounted in capacities from 250 to 1,000 gallons.



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it says LOOK OUT

- The accepted standard odorant for natural or liquefied petroleum gas — gives sure but harmless warning.
- Purified — Moisture-free — PROTECTS FIXTURES. Meets all 15 qualifications of National Bureau of Standards.



MALLINCKRODT CHEMICAL WORKS
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72 Gold St., New York 8, New York

tions. These requirements apply to all highway transport vehicles transporting anhydrous ammonia in interstate shipments. The indications are that some state regulatory bodies are becoming increasingly aware of ICC requirements and regulations for the safe transportation of anhydrous ammonia.

Pressed Steel's Hackney ammonia tanks are furnished with permanent identification tags which mark each valve and opening, and all are grouped under a protective cover which can be locked to prevent unauthorized tampering, as required by ICC-MC330.

Hackney tanks are painted with a white enamel top coat, over a tough, protective base coat, and they are properly stenciled for anhydrous ammonia service as required by the ICC regulations. Both 500- and 1000- gal. capacities are available in diameters of either 41 in. or 46 in. A heavy-duty hose assembly, 12½ ft long, is supplied with each tank.

Recent Legislation Concerns L. P. gas

Ann Arbor, Mich., has adopted a basic building code incorporating by reference as standards for liquefied petroleum gas the 1953 edition of Pamphlet No. 58 of the National Board of Fire Underwriters.

The board of standards and appeals of Cleveland has adopted rules and regulations regulating the design, construction, etc., of L. P. gas containers and systems under jurisdiction granted by the recent Cleveland ordinance removing restrictions on L. P. gas use in that city. The regulations are the May, 1954, edition of Pamphlet No. 58 with four minor additions.

Detroit has adopted an ordinance regulating the design, construction, installation and use of LPG containers and systems in the city. The ordinance requires permits for certain

installations. The regulations are substantially the same as the NFPA standards with such changes in these standards as are affected in the Michigan state regulations.

Safety Car Heating Buys Canadian Firm

Safety Car Heating & Lighting Co., New Haven, Conn., has purchased Liquefied Gas Utilities Ltd. of Montreal.

The U. S. firm, manufacturer of air conditioning and other equipment for railway passenger cars, took over the Canadian distributor of liquefied petroleum gas and appliances as a wholly owned subsidiary.

Safety Car had previous interests in Canada in Pintsch Compressing Corp., another wholly owned subsidiary, which has been manufacturing and supplying Pintsch gas in tanks to all Canadian railroads.

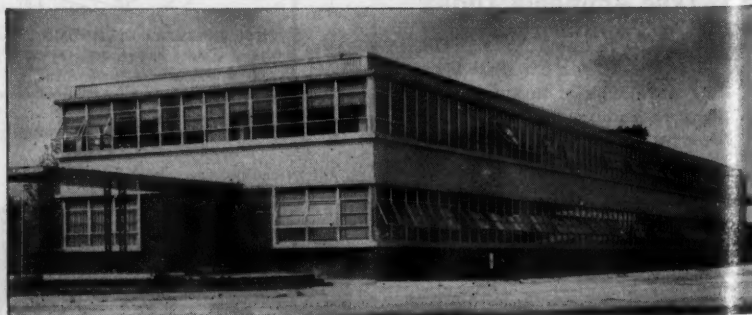
Mutual Liquid Gas Leases Special Cylinder Truck

Mutual Liquid Gas & Equipment Co. Inc., Gardena, Calif., has recently taken delivery of a new Reo truck with a special Moda propane cylinder body, for service of the company's industrial accounts in the Los Angeles area.

The body carries twenty 100-lb cylinders and 28 trailer-type cylinders. This latest addition to the Mutual fleet is one of five trucks supplied to the company by Reo Truck Leasing Inc.

Perfection Appoints Texas Distributor

Joe Thiele Inc., San Antonio, has been appointed distributor of Perfection Stove Co. products in the south Texas area. This company will handle the complete Perfection line.



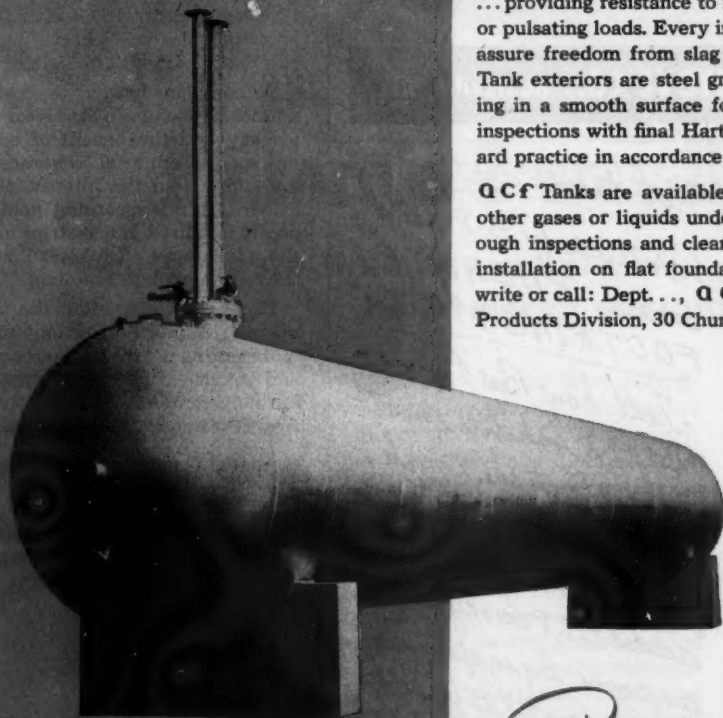
Administration building of American Cyanamid Co.'s recently completed Fortier plant near New Orleans. The plant marks Cyanamid's entry into the field of anhydrous ammonia sales.

which is the QUALITY TANK?



Both tanks look alike, but only the Q C f-built tank has extra quality you can depend on! After fabrication, they are stress-relieved to eliminate stresses set up during forming and welding ... providing resistance to fatigue caused by temperature changes or pulsating loads. Every inch of welding seam is *radiographed* to assure freedom from slag inclusions, porosity and undercutting. Tank exteriors are steel grit-blasted to remove mill scale, resulting in a smooth surface for the red lead primer. Exacting shop inspections with final Hartford Steam Boiler Inspection is standard practice in accordance with ASME 1952 Code W-XR-SR.

Q C f Tanks are available for propane, anhydrous ammonia, and other gases or liquids under pressure ... with man-ways for thorough inspections and cleanings ... with steel saddle supports for installation on flat foundations. For more specific information, write or call: Dept. . . , Q C f Industries, Incorporated, Industrial Products Division, 30 Church Street, New York 7, N. Y. B-12



ask us

...about our new 30,000 gallon tank only 50 feet in length. Takes less installation space ... allows single-car rail shipment and cross-loading on export barges. Weight: only 67,000 lbs. costs far less to ship!

qcf

Quality you can trust



..... STORAGE TANKS • TRUCK TANKS • SAFETY VALVES



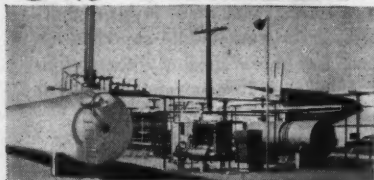
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sends to you
Season's Greetings today
None can be warmer
We make them that way!

P.S. 1955 will be our 50th Anniversary Year



MARTIN STAMPING & STOVE CO., Huntsville, Ala.

Gas STANDBY



Packaged 12 mcfh plant designed and built by Draketown for . . .

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- ★ Peak shaving and augmentation
- ★ 100% Town or plant supply

A Packaged Draketown Propane Plant will help you reduce demand charges; provide a supply of gas during curtailment periods . . . at the turn of a valve . . . or supply that outlying section or plant 100% if desired.



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Write adv for B-P NEWS
on our ROSKOTE
FOOTRING MASTIC*

*Tell how Red Primer
#4452-A inhibits rust-
and about the tough
moisture barrier ROSKOTE
provides—with long life.
added to L.P. gas cylinders,
as proven by inspection of
cylinders coated 3 yrs ago.
Don't forget to offer samples.
(We need distributors, too.)
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Dixie Gas Establishes Remarkable Safety Record

The transport drivers of Dixie Gas Inc., Marks, Miss., chalked up 1 1/2 million miles in 462 days without an accident. Drivers cover central and northwestern Mississippi.

For Dixie's outstanding record the United States Fidelity & Guaranty Co., Dixie's insurance carrier, presented the company with a certificate of meritorious service. Lewis A. Graeber, Dixie president, accepted the certificate on behalf of the company.

Inland Gas Co. Enters AA Field

Inland Gas Co. of Logan, Utah, has entered the field of anhydrous ammonia. Starting the AA business in October, Inland Gas became the second Utah AA dealer, following a Salt Lake City firm which started in mid-1954.

Before Inland announced its anhydrous ammonia service, it treated a three-acre test plot behind its storage lot with 100 lb of NH₃ per acre and planted the lot with fall wheat.

When Inland made the official announcement of its AA business, it had already had the benefit of advance newspaper editorial coverage, and had stimulated the interest of civic leaders. A fast-sprouting field, purposely fertilized in test strips to show the advantages of AA fertilizer, attracted immediate attention.

The first week after the official opening 25 northern Utah farmers, representing nearly 4000 acres of crop and pasture land, came to the office for more complete information about AA. Test applications were made on



Inland Manager Dean Hale measures growth of fall grain in three-acre test field near firm's office. The grain compelled farmer interest, brought orders for test applications and soil sample tests during first AA week at company.

LP Gas Dealer* Gains \$1437 profit per truck per year!



Motorola 2-way Radio

**cuts waste time and mileage ...
helps serve customers better!**

Here's how one Motorola-equipped LP Gas Dealer figures the cash benefits of 2-way radio.

Truck costs saved.....	\$ 137.28*
Labor costs saved.....	1040.00**
Telephone calls saved....	260.00
Saved per year per truck..	<u>\$1437.28</u>

*At 33 MPH average speed, 2 hours a day saved for 260 working days equals 17,160 miles per year. 8¢ per mile for gas, oil, depreciation, miscellaneous.

**2 hours working time saved per day for 260 working days at \$2.00 per hour.

Average \$1.00 per day for 260 working days for telephone costs.

Weigh the cost of Motorola 2-way radio against the gains (shown at left)—\$1.00 per day, per truck average including the Motorola maintenance service contract—it doesn't "cost" it pays 3 to 1 on your investment.

And that's not all you get! On-the-spot credit reports to expedite collections, road repairs in record time, new customers added "en route," spectacular elimination of stalls and over-time, more efficient routing, fast customer emergency handling, quick ap-

pointments for appliance sales, and the improved morale of an alert service—all of these can add to your competitive advantage.

Let us send a qualified Motorola engineer to give you the rest of the story. He'll put your interests first and follow through with the support of the largest *exclusively-radio* service organization in the field. Remember—it pays to own your own radio system and it pays to insist on the best while you're doing it.

*Name on file

Motorola Communications & Electronics, Inc.

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Just what's wanted in home incinerators!

IT'S CLOG-PROOF, RUST-PROOF
AND WON'T BURN OUT.....



The COLE HOT BLAST HOME INCINERATOR

meets homeowners' every demand for top value and performance. Here are just a few of the COLE features:

- Economical gas operation with exclusive, patented, air-jet combustion. Genuine refractory tile lining . . . rust-proof, clog-proof, permanent.
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Write today for complete specifications of both Deluxe and Standard Models.

COLE HOT BLAST MFG. CO. 3817 S. RACINE AVE.
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Smoothly Bends ANY
Pipe or Tubing

$\frac{3}{8}$ " to $1\frac{1}{8}$ " O.D.



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See your supply house — or write for free folder today.

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EVANSVILLE, INDIANA

ONLY RECTORSEAL #2

offers you
so much
for
so little



In thread compounds, Rectorseal #2 leads the field in quality.

Just consider these advantages:

Thin in the can, it's easier, more economical to use. Thick in the joint, it holds pressures to 11,350 psi. Insoluble in L.P.G., natural and manufactured gas — all petroleum fractions, and anhydrous ammonia. Never hardens, crumbles, cracks or gets brittle. Holds odorants. Ideal for all gas industry thread joints. Conveniently packaged in brush-top cans for easy, economical application.

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Write for free sample and additional information.

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RECTORSEAL # 2

MAKING THE L.P. GAS INDUSTRY SAFER



Checking the progress of a new coupling for Roney's anhydrous ammonia line are Tool Room Supervisor Elmer Blue, left, and Production Manager Ray Hays, right. Roney Inc. of Dallas has recently expanded its precision line of fittings and equipment available for AA use.

35 acres on four farms and soil tests were ordered for 10 more farms. A college agricultural implement class requested and received a company demonstration.

Inland Gas plans to make its AA interests an extra business, completely separating AA from the company's regular gas business.

McNamar Manufactures AA Transports, Tanks

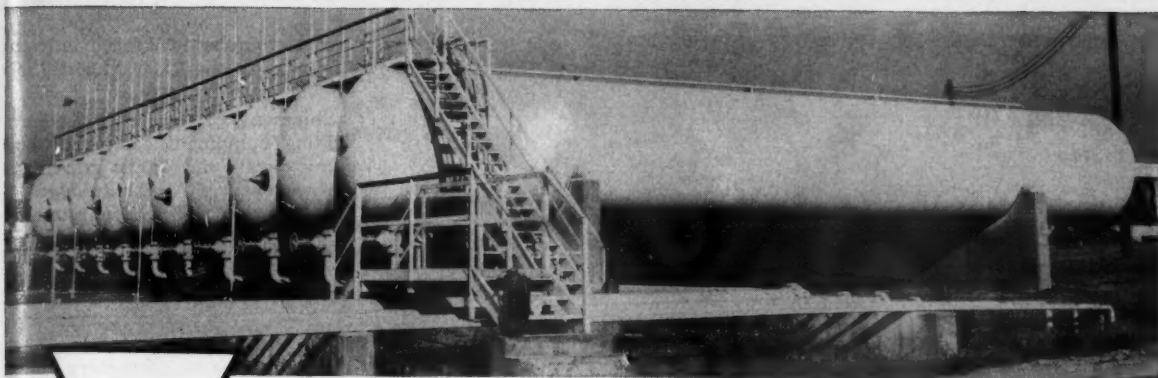
McNamar Boiler & Tank Co. of Tulsa, has announced its entry into the manufacture of a complete line of transports and truck tanks for the LPG and anhydrous ammonia industries. Jerry Hardegree, manager of the LPG and AA division, states that the transports and truck tanks will be manufactured of highest tensile steel under the latest codes in order to provide the dealers with maximum pay load.

The truck tank unit will be manufactured in both single-barrel and twin-barrel sizes. They will range in capacity from 1300- to 2400-wg capacity. Transports included in the new line will range in size from 5500- to 7435-wg capacity.

Gas Water Heater Shipments Up 12%

Shipments of automatic gas water heaters during September were 17.2% above the total for the same month of last year, according to the Gas Appliance Manufacturers Association.

Edward R. Martin, GAMA's director of marketing and statistics, reported that gas water heaters shipped to dealers and distributors during the



Neat and Strong

...two good reasons for buying LP-Gas Storage Tanks designed and built by Downingtown Iron Works. Exceptionally neat welds improve the appearance of your installation. Extra-strong welds—X-ray controlled for soundness—mean less maintenance, longer life. These advantages are the result of special welding techniques de-

veloped by Downingtown welding experts.

Construction meets all requirements of ASME and NBFU. Equipped with first-quality valves and fittings if desired. Foundation drawings supplied if required.

Capacities from 4,000 to 30,000 gallons (W.C.). Write for detailed specifications.

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Downingtown, Pennsylvania

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MANUFACTURER OF HACKNEY PRODUCTS

LP-GAS CONTAINERS FROM ONE POUND TO 30,000 GALLONS



NO. 2

PLUMBERS FURNACE

Mutual

YOUR FIRST CHOICE

MOST EFFICIENT AND VERSATILE LP-GAS FURNACE BUILT

Light a match and—POOF—you're in business. Demonstrate this furnace to plumbers and maintenance men and you've made a sale.

This Mutual furnace employs the principle of the venturi to assure perfect combustion; uses less gas and more air. Produces a hotter flame and does the job faster. Will melt 60 pounds of lead in 12 minutes. No smoke, no priming or pumping.

This unit is well balanced, will not tip over, and is extremely rugged to withstand severe abuse. The No. 2 Furnace fits Mutual 12 and 20 pound ICC cylinders. The No. 2-A bench model may be used with any Propane cylinder. The No. 2 and No. 2-A Furnaces include non-warping head, adjustable orifice and tube, and removable handle and shield. Simplicity of design, having only three main parts, makes the Mutual No. 2 and No. 2-A furnaces dependable and fool-proof.

Like all Mutual products its design reflects years of engineering "know-how". A demonstration will win a new customer.



NO. 2-A BENCH
TYPE FURNACE

Send today for free catalog on Mutual's complete line.

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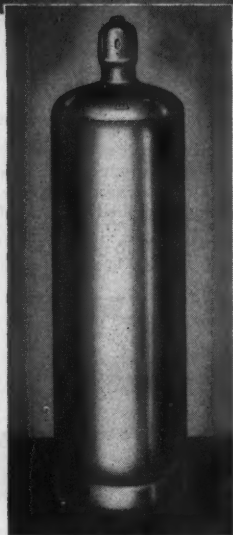
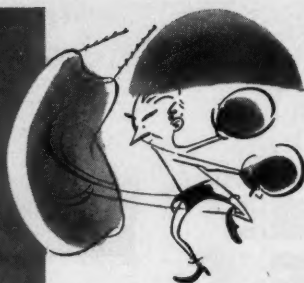
Mutual

LIQUID GAS EQUIPMENT CO., Inc.

3638 WEST IMPERIAL HIGHWAY

INGLEWOOD, CALIFORNIA

LIGHT...
BUT TOUGH
AS THEY COME!



Harrisburg Lite-Weight Cylinders can't be beat when it comes to maximum safety and quality with minimum tare weight. Built to I.C.C. 4BA-240 . . . tested to 480 p.s.i., plus Harrisburg's own rigid strength and uniformity tests . . . they are used and approved by LP gas dealers and bulk plant operators wherever cylinders of superlative dependability are wanted. Write today for Lite-Weight Cylinder Catalog and current prices.

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Harrisburg Steel
CORPORATION
HARRISBURG 4, PENNSYLVANIA

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We are signing franchises with bottle gas dealers all over "hard water" America. You have the set-up and the customers. Deliver rental softener units to homes, laundries, beauty parlors, cleaning plants . . . wherever soft water is needed. All you need are the softener units and the inexpensive regeneration equipment. Franchise includes the sale of DOWEX to all domestic, commercial and industrial areas.



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10 DAY TRIAL OFFER

Try the Martin Tube Bender on the job for 10 days. If you are not satisfied with its performance, return it to us and we will not bill you.

If you decide its the best bender you ever used and keep it longer than 10 days, we will bill you the regular price of \$19.50 plus postage and insurance charges.



BEND TUBING
EVENLY in
close quarters
with little effort

Dimensions: 9 1/2" x 3 1/2" x 3 1/2" — weight 4 1/2 lbs. Two sizes handle all jobs: #5 bends 3/8" and 1/2" o.d. soft tubing, #5A bends 1/2" and 3/4" o.d. soft tubing. Each without roll changes!

All bends are on 1 3/4" radius and are practically distortionless. Gear arrangement operated by ratchet lever

rolls the bend in the tube easily, makes bends in either direction by turning tool over and operating from other side. Sturdy — compact.

Write today for details on our free trial offer.

W. H. MARTIN Tube Benders
Box 692, Owensboro, Kentucky

month numbered 205,500 units as compared with 175,300 during September of 1953.

Shipments of gas-operated central heating equipment continued their climb toward new highs in September with a 19.6% increase over the same month of last year for a total of 666,100 units during the first nine months of the year.

Cities Service Adds Five-Story Annex

Construction of a five-story annex to the present Cities Service building in Bartlesville, Okla., has begun, with completion set for the middle of 1955, it has been announced by S. B. Irelan, president of Cities Service Oil Co.

The Masonic Lodge of Bartlesville, owner of the present nine-story Cities Service building, will build the annex. Final approval of the construction program was given at a meeting of the lodge recently in Bartlesville. Cities Service will hold a long-term lease on the new office building.

In addition to having a full basement, the annex will join the old building at each floor level. Design of the proposed reinforced concrete building will blend into the existing structure.

Bowser Has New Distributor

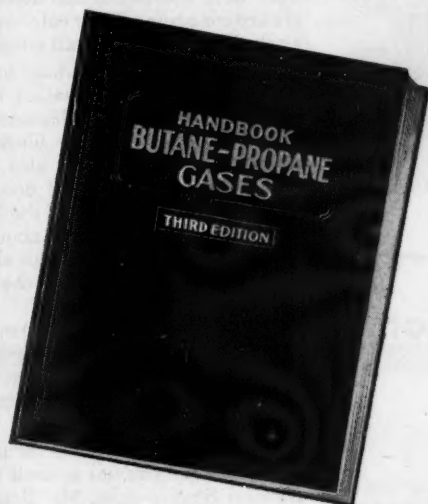
Peninsular Distributing Co. is a newly-appointed distributor for Incinor. The announcement was made by Clifford E. Hall, sales manager of the Incinorator division, Bowser Inc., Cairo, Ill. The new distributor will cover the Detroit trading area and will handle the complete line of indoor and outdoor residential and commercial models.

AGA Wins Safety Award

National Safety Council has presented to American Gas Association a "National Award of Merit for Exceptional Public Service in the Prevention of Home Accidents During the Year 1953-1954." The program which led to this recognition was aimed at safe space heating in America's motels, tourist courts, and cabins.

The award was made at the annual conference of the National Safety Council in Chicago recently by Ned H. Dearborn, president of the council. The certificate was received by James F. Oates Jr., chairman of the board of the Peoples Gas Light & Coke Co. and a director of the American Gas Association, on behalf of AGA.

The Only Complete Reference Book on Liquefied Gas Engineering, Installation and Operation



352 PAGES of Technical Facts, Charts,
Diagrams, Photographs, Including Latest
Processes and Materials.

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News

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For years, *White* has led the field with strong sales points that actually translate themselves into *consumer benefits*—advantages that clinch sales fast because they give your customers more for their money. Now, with *White Glass* lining added to *White's* many exclusive features, sales come "thicker and faster" than ever. Write for *White's* Proved-Profit Story—right now!

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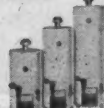


WATER HOTTERS

Automatic Water Heaters
for LP Gas



20 gal., 30 gal.,
40 gal. and 60 gal.



Plus 14 other strong selling advantages!

White Glass LINING

Can't rust ... EVER!
An essential sales point
in many areas—im-
portant in all.



NATIONAL ADVERTISING

White Water-Hotters are and have
been consistently pre-sold for you in
large, color advertisements in lead-
ing consumer magazines over many,
many years.

FILM OF FLAME

Single port burner in
gas WATER-HOTTER
means NO clogging
ever. Amazingly fast
"pick-up" for PLENTY
of hot water always.





Gas dealer-home builder cooperation produced this all-gas sample home in Newtown Square, a suburb of Philadelphia.

Dealer-Home Builder Cooperation Sells Gas and Appliances

ALLIES are needed if L.P. gas is to win the current war with electricity and fuel oil. And a very important ally to the LPG fuel and appliance businesses is the home builder.

It was through a gas dealer-home builder cooperation plan that Art Bone, president of Eastern Propane in Malvern, Pa., won a share of the prize suburban home building business.

Mr. Bone cooperated with a builder, the Contemporary Home Co., to the extent of installing a complete L.P. gas setup in a sample home in the St. Albans development at Newtown Square, a suburb of Philadelphia. The home contains an American Standard heating system, an A. O. Smith water heater, and a Caloric built-in kitchen, all operating from a 500-gal. underground tank.

Mr. Bone is concerned about new suburban construction. "Only a small part of the giant suburban business

has been going to LPG," he says. "Mostly it has gone to electricity and fuel oil."

Mr. Bone's first move in his battle for the home building business was to sell the use of LPG to a builder. "The builder is not interested in doing missionary work for L.P. gas," Mr. Bone says. "Since electricity and fuel oil are so well established, and the public is acquainted with them, there must be extra sales work."

The builder is also reluctant to cooperate in building all-gas houses because of some additional effort involved in selling the completed home. However, current buyer attitudes are forcing the builder to seek "extras." This is the gas dealer's business cue. "As the new home market tightens," says Mr. Bone, "the builders are becoming more interested in good name-brand appliances to sell houses. This is where gas should move in."

Architects and home builders

throughout the nation are leaping at the opportunity of making their kitchens more beautiful. They are adding regular appliances and built-ins. They have also found that homemakers are concerned about color in their kitchens to relieve overall whiteness.

Caloric Stove Corp., whose built-in gas range unit was installed in the sample home, offers homemakers their choice of color or black and white. On its built-ins it also offers detachable handles in 12 decorator colors, which means that if the homemaker changes her mind about the color in her kitchen, she can always get different handles in the new color to suit her decor.

Mr. Bone used all this information, plus the point that costs are lower for gas appliances than for electric, when he presented his plan to the president of Contemporary Homes Co.

Since public acceptance for an all-L.P. gas home was not present in the Newton Square area, Mr. Bone did three things to convince the builder to install L.P. gas. He gave the builder a good price on the installation. He cooperated with the builder in advertising the model home, and he helped to sell on the spot. Mr. Bone had a man at the sample home all the time telling the LPG story, thus combining an educational program with sales.

The sample home, for a projected development of 15 units, was single story with crawl space, and contained 1360 sq ft on a lot 100 by 153 ft. It had three bedrooms, two complete baths, living room and dining area with studio ceiling, storage room and garage, and a large kitchen-activity room. It was completely insulated and furnished with Philippine mahogany kitchen cabinets, doors and wall panelling.

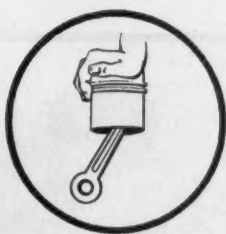
Against the advice of realty experts, the sample home was opened on Memorial day weekend. Despite these misgivings, the home had 1800 visitors those first three days and has attracted some 3000 people since. The builder said, "We are especially satisfied with our showing because we attracted only the tough shoppers. In this price range we drew people who already own homes."

Thirty persons indicated a definite desire to buy these homes. And they all requested most gas appliances. Due to the expert on hand to tell the LPG story, most visitors had their belief in the superiority of gas over electricity forwarded.

According to the builder, visitors liked the studio windows, panelling, and other deluxe features of the house, but the gas range definitely interested them the most.



A built-in gas range unit was installed in the sample home in Newtown Square. It was the main interest-catcher in the kitchen.



Butane-Propane

POWER SECTION

INSTALLATION • CARBURETION • SERVICING



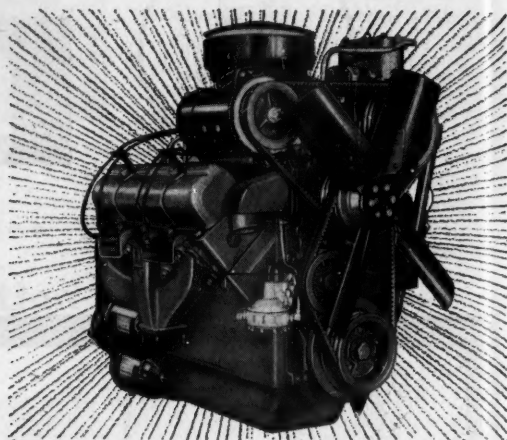
Forklift, converted to L. P. gas, is in constant use at Lockheed Aircraft's Burbank plant.

(For a story about Lockheed's conversions to LPG, turn to page 163.)

Truckers asked for it... now in production

THE NEW MIGHTY REO V-8

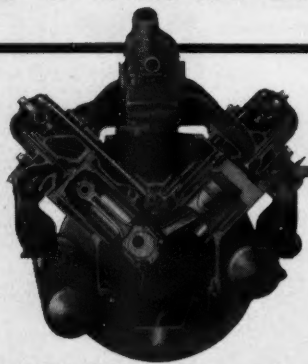
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MOST POWERFUL V-8 TRUCK ENGINE EVER BUILT

HERE IS DYNAMIC, USABLE HORSEPOWER

Power for speed...for grades...for flashing acceleration...for effort-less heavy-duty operation without strain. The new REO V-8 is all engine, yet smooth as silk.



Only 39 $\frac{1}{4}$ " long overall!
Weight: only 1211 lbs.!

HERE IS A SHORTER ENGINE

The new REO V-8 is shorter than any other heavy-duty truck engine...just 39 $\frac{1}{4}$ " overall! Permits bumper-to-back-of-cab dimension of only 96"—hauls 35-ft. square nose trailers without exceeding 45-ft. overall vehicle length.

HERE IS A LIGHTER ENGINE

The new REO V-8 weighs less than any other heavy-duty truck engine on the highway—less than half as much as some. It hauls more revenue, legally, than any other engine.

195 h.p. 220 h.p.

HERE ARE MORE MILES PER GALLON

The new REO V-8 is downright stingy with gas—delivers up to 150 extra miles, and more, from every 100 gallons.

HERE IS EASIER MAINTENANCE

In the new *Gold Comet*, REO has achieved one of the cleanest V-8 engines ever designed. It's convenient, accessible—everything is within easy reach.

HERE IS LONGER ENGINE LIFE

No truck engine anywhere can compare with the new REO V-8 for long-term profit-potential. Outstanding stamina helps the new REO V-8 deliver highest ton-mile profits ever known in heavy trucking.

HERE IS A REALLY MODERN TRUCK ENGINE

The REO V-8 is not a souped-up version of an old, outdated power plant. It's all new, from fan to fly-wheel! Output? A startling $\frac{1}{2}$ h.p. per cu. in. of displacement—more than 25% higher than the next nearest engine; 35% more than the average of all engines of 360 cu. ins. and larger. It's the world's most modern truck engine.

**THE REO V-8 IS
A FITTING COMPANION
TO THE WORLD-FAMOUS
GOLD COMET 6**

REO MOTORS, INC. LANSING 20, MICHIGAN



BPN field report

Lockheed arranged for distribution of individual tanks by taking a truck and designing a rack on which the tanks could be safely secured.

A typical Lockheed forklift after it was converted to propane. Overhauls are not necessary until after 8000 to 12,000 hours of use.



Materials Handling Conversions Cut Costs, "Down-Time" for Lockheed

By L. J. Rowley
Lockheed Aircraft Corp.
Burbank, Calif.

AFTER having invested a total of approximately \$22,000 to convert from gasoline to propane, Lockheed Aircraft Corp. conservatively estimates an annual savings of from \$35,000 to \$40,000 in the operation of its 120 materials handling units.

Over a year and a half ago the Burbank, Calif., plant of this major aircraft company began to explore the possibility and practicability of converting its factory transportation units—fork lifts, towing tractors, die handlers—from gasoline to propane. The idea was reviewed by safety engineers, the Lockheed fire department, Burbank fire department and by Lockheed's insurance carriers. Their approvals were obtained and the conversions were begun in May of this year.

Although the company has operated on propane for only a short time, it has found that the fuel has many advantages over gasoline. A saving estimated at 60% in the cost of the fuel per gallon has been realized with propane; and carbon and lead deposits have been eliminated, engine wear has been reduced, crankcase oil is no longer diluted, and an 85% reduction in the use of lubrication oil

has been achieved. Operation is quiet and smooth.

Instead of changing oil every 50 to 100 hours of constant use, as was necessary with gasoline, Lockheed has found that propane-equipped vehicles need a change no less than every 1000 hours. And where it had been a practice to overhaul the equipment after every 1000 hours of use, it now appears that overhauls will not be necessary until after 8000 or 12,000 hours of use.

Lockheed has noticed one improvement, since conversion, that had not occurred to the company before. Its fork lifts and other units idle a great deal of the time. With gasoline the company was experiencing considerable difficulties with spark plug fouling, which resulted in many calls for mechanics to clean or replace the spark plugs. With the use of propane this problem has almost disappeared because of the almost complete combustion of propane. While the cost factor of spark plug fouling was not great, the "down time" on equipment while waiting for repair or replacement was considerable.

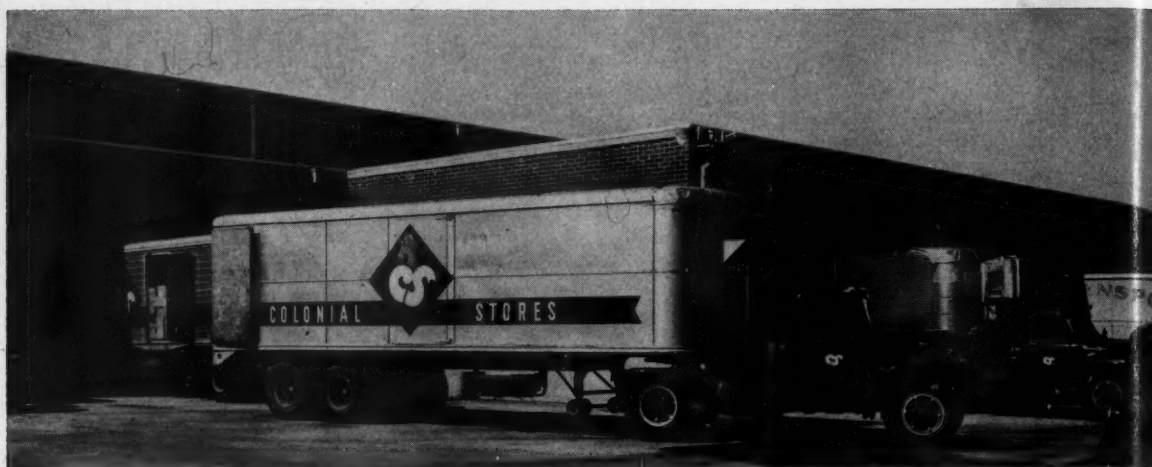
The almost complete elimination of noxious fumes is another point in

favor of propane, according to Lockheed. Carbon monoxide fumes have long been a source of complaint from the employees operating the factory units, particularly in closed areas.

Lockheed constructed a 10,704-gal. propane capacity storage tank on its property. This is sufficient since the average truck and trailer load is approximately 8000 gal.

Since the company erected only one storage tank for its entire operation, it had to arrange for the distribution of the individual tanks to the transportation equipment located in various areas of its two plants in Burbank. To do this the company purchased an additional quantity of small tanks, took one of its older trucks and designed a rack on which the small tanks could be safely secured for movement between areas.

A service station attendant was assigned to the full-time job of filling the empty tanks at the main storage area. Then on a regular route he removes the empty or nearly empty tanks from the fork lifts or other units and replaces them with full tanks. The 10-gal. tank is sufficient for more than a full shift and there are few emergency calls for fuel.



The truck that the Colonial Stores drivers fight to get. It has 12 more horsepower than the same engine operating on gasoline.

What Colonial Stores Has Learned In Making Pilot Conversions to LPG

By Harold C. Hood
Field Editor

LIKE many other truck fleet operators investigating the rapidly spreading propane conversion movement, Colonial Stores Inc. of Atlanta has been favorably impressed with the possibilities offered by this automotive fuel. Extensive tests are currently in progress to determine the feasibility of switching the whole fleet to propane. Although Herbert M. Thornton, methods engineer in charge of the conversion program, reports that it is still too early to draw any final conclusions, enough data have been obtained to point up some highly significant findings.

Colonial's initial venture in the field of propane power turned out to be somewhat disheartening, due primarily to inexperience and the lack of proper guidance. It consisted of converting a rebuilt 354 cu in. engine. This choice was made primarily because of the engine's failure to perform satisfactorily on gasoline.

By shaving down a standard 6.5:1 cylinder head the compression ratio was increased, but, as was discovered later, not sufficiently. The standard manifold was retained rather than being replaced by a "cold" manifold as is now recommended, and in order to utilize either gasoline or LPG a

dual carburetor was installed. When the engine was tuned for gasoline, it ran "ragged" on LPG, and when set for LPG its efficiency on gasoline was very low, as was to be expected.

Colonial engineers readily admit that they were groping in the dark on this first conversion; they lacked the necessary experience in the realm of LPG—and were not surprised when the truck covered only three miles per gallon with propane as contrasted with the five miles it had made when on gasoline. This particular project was abandoned late in 1950.

Second Try

The next experiment was a different story. In November, 1951, a new White 150 AH motor was chosen for conversion and installation in a 1946 EHT Mack tractor with a five-speed direct in fifth transmission and a single reduction differential. Tires on this tractor are 1000 x 20, and it is used for pulling loads of 40,000 lb net on a 32-ft tandem trailer.

Colonial applied all the hard-earned experience of the first conversion to this one. A "cold" manifold was obtained and a high compression head with a ratio of 8:1 was installed. Car-

buretion items such as lock off valve, regulator, and carburetor were bought specially for the job from the Ensign Carburetor Co. The gas tanks were the only items of equipment salvaged from the original test.

Among the pleasant results of the changeover was an increase of 12 hp. Drivers show a definite preference for the LPG unit over similar gasoline-powered units because of snappier handling and more pep on the tough hauls. Prior to the second conversion, Colonial had obtained a chassis dynamometer which facilitated accurate adjustments of the ignition and carburetor. This was almost a necessity, as engines cannot be made to knock on propane, so tune-up procedures dependent upon knocking were useless.

LPG Unit Preferred

In order to compare maintenance and operating efficiencies, careful records were kept on the propane-powered tractor and on three gasoline units of comparable size. All units had White 150 AH engines of 386 cu in. displacement. Units designated as No. 1, 2, and 3 used gasoline. The

LPG engine was labeled unit No. 4. Case histories of the four engines are outlined below:

Unit No. 1

Installed Dec. 1, 1949.

Head gasket replaced at 56,572 miles.

Head gasket replaced again at 72,638 miles.

At 85,466 miles No. 1 piston was replaced with standard piston.

Rings were changed, valves ground, and the center exhaust manifold was replaced.

Valves were ground again at 94,198 miles, and No. 4 exhaust seat was replaced.

Head gasket was again replaced at 121,001 miles.

No further engine trouble to date.

Unit No. 2

Installed Dec. 15, 1949.

Head gasket replaced at 55,594 miles.

Head gasket again replaced at 84,947 miles.

Manifold gasket replaced at 114,369 miles.

At 172,959 miles the engine was removed and rebuilt with standard rings. Rod and main bearings were replaced and valves ground.

No additional maintenance.

Unit No. 3

Installed Dec. 5, 1950.

Valves ground at 128,576 miles.

At 145,403 miles engine removed and rebuilt. Block bored .030 in., rod and main bearings replaced, valves ground and manifold replaced.

No further maintenance.

Unit No. 4

Installed Nov. 9, 1951.

At time of installation, head was machined from 6.5:1 ratio to 8:1 ratio.

Cold manifold installed at same time.

Head gasket replaced at 19,112 miles.

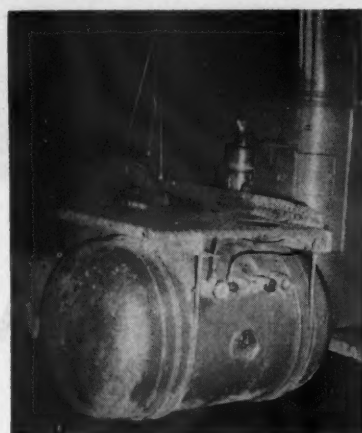
Head gasket replaced at 37,191 miles.

Head gasket replaced at 91,890 miles.

Head gasket replaced at 103,889 miles.

Unit currently has 140,000 miles and has had no additional mechanical trouble.

The cause of recurring head gasket failure on unit No. 4 lay largely in the fact that the compression ratio had been stepped up considerably above that for which the engine was designed. Some similar trouble had been experienced on standard gasoline models and has been rectified in later models of the same engine by increasing the number of head bolts used in critical areas. It was also



Gas tank is mounted on the right side, the safest location in relation to possible traffic accidents.

learned that Colonial's head gasket replacement could have been greatly reduced by the use of a vacuum gage in the cab, and instructing the drivers to maintain at least 5 in. of vacuum at all times.

Oil was changed in all gasoline units regularly at 3500 mile intervals. The LPG unit had oil changes only at the time of head gasket replacements and then only because water had leaked into the oil. All engines were equipped with oil filters.

Oil in all units was SAE 30, but because of a tendency for the oil in the L. P. gas unit to thicken, "make-up" oil in this engine was SAE 20. Oil samples were removed from the LPG unit at regular intervals and sent to the laboratory for testing. The results of one such analysis, made after 18,000 miles were:

Viscosity, Saybolt Universal at 210° F	63.6
Ash	0.22%
Solids	0.08%
Asphaltenes	0.03%
Water by distillation	None
Dilution	0.04%
Neutralization No.	0.50

BPN staff report

There was very little variation in the samples tested, and the laboratory report each time was to the effect that the oil was in excellent condition. The oil has not been changed for the past 61,000 miles. The oil filters on the gasoline engines were changed each time the oil was changed, but that on the propane unit was changed only when the oil began to darken, probably because of failure of the filter element.

Costs Calculated

Colonial has calculated the cost per mile of each unit, including fuel, oil, repair parts of the entire unit, tires, and repair labor. Original cost of the conversion parts for unit No. 4 were not included, however. These figures appear below:

	Miles Per Gal.	Cost Per Gal.
Unit No. 1.....	5.0	\$.1002
Unit No. 2.....	4.6	.0866
Unit No. 3.....	4.6	.1138
Unit No. 4.....	4.5	.1066

One reason for the relatively high cost per mile of unit No. 4 was that at the time these figures were calculated the company was paying 2.5 cents per gallon more for propane than for gasoline. This was due partly to the geographical location of the company and the fact that it did not have bulk storage facilities to buy at tank truck rates. Since then, storage tanks have been installed at the company's warehouse and the cost of fuel has been lowered three cents per gallon.

It is interesting to note that, at 91,890 miles, unit No. 4 showed only 0.015 in. of wear on the cylinder walls. Both units No. 2 and No. 3 had approximately 0.030 in. when rebuilt. There had been practically no carbon deposited in the combustion chamber, on valves or pistons of unit No. 4 any time the interior of the engine had been inspected.

No final conclusions have been drawn by the company, but the idea of converting more of the fleet to the use of propane is becoming more feasible with each new development.

Coast Materials Co. operates 15 trucks on propane. These seven trucks operate from the Gulfport plant; eight others operate from Beauvoir, Miss., covering a 40-mile area along the Gulf coast.



field report



Even Without High Compression, Cold Manifold

LPG Saves for Ready-Mix Fleet

By A. Moreton

EVEN though high compression and cold manifolds are needed for maximum saving in converted trucks, substantial gains may be made without these "extras," provided that there is a suitable differential in cost per gallon. And the savings in oil and maintenance costs are just as great as if the conversion had included the above items. This is clearly shown by two years of experience at Coast Materials Co.

Coast Materials, with headquarters in Gulfport, Miss., owns and op-

erates a fleet of 15 International ready-mix concrete trucks at two plants. One plant is in Gulfport and the other in Beauvoir.

Since 1952 all trucks have used propane. To fill construction needs over a 40 mile industrial area along the Mississippi gulf coast, the company decided to switch its entire fleet of Navy surplus 6 by 6 trucks to propane because the price of gasoline kept increasing; loss from pilferage was approximately 100 gal. of gasoline a month from the 15 trucks, or \$182 a year, and necessary oil drains every two weeks for each truck cost the company \$302.40 a year. The firm thought it could do a better job more efficiently and economically with propane.

The change was made in the company shop. The 15 International trucks were converted under the supervision of Ray B. Anderson, superintendent of the Gulfport and Beauvoir repair shops for the past ten years. Mr. Anderson said, "We converted the trucks in the busy season and it was necessary to get the job done as soon as possible. A rush job was needed because at that time Keesler Air Force base was undergoing an expansion program, adding houses and barracks which required 150,000 yd of concrete and Coast Materials held the contract."

So as the trucks were brought in for overhauling the four shop mechanics, using Algas equipment and working over week-ends, converted the trucks to propane at the rate of one a day. The speed at which the work had to be done made it impossible to go into some of the fine points of conversion such as raising compression and installing colder manifolds. The total cost for converting each truck was \$400. Broken down it amounted to \$360 for necessary parts and \$40 for labor.

All these International trucks have Red Diamond 361 engines. The mix-



Coast truck comes in for a concrete refill. Propane tank has 55-gal. capacity and requires only one filling a day.



Pouring concrete for a new Woolworth store in Biloxi, Miss., is one of Coast Materials' 15 Navy surplus trucks.

ers have engines of different types. Three mixers have QXB5 Hercules engines, three have HAX Waukasha engines, one is a Chrysler industrial, four are 6-cylinder Ford industrial engines, two are 4-cylinder Ford industrial and two are 4-cylinder Continental.

For each truck converted the following parts were used: one fuel tank, 2 carburetors, 2 regulators, copper tubing, hose and filters. The Pond-Johnston Co. in Mobile, Ala., supplied all the parts with the exception of the filters which were purchased locally.

Company records from October, 1952-1953, show that this fleet of Navy surplus ready-mix concrete trucks used 51,785 gal. of propane with an overall savings of seven cents per gallon. This alone saved Coast Materials \$3625.65 in one year. The average loss of \$182 a year from pilferage of gasoline was completely eliminated after changing to propane. Propane is put in the tank under pressure and cannot be taken out.

Each truck uses an average of 287 gal. of propane a month or 4315 gal. a month for the 15 trucks.

Coast operated its fleet of trucks less than a year before switching to propane and figures for comparison of maintenance cost of gasoline and propane are not available.

The trucks were formerly brought into the repair shop for a complete overhaul once a year. Ring wear causes oil consumption requiring a complete overhaul. In 1952, when the engines were converted to propane, Mr. Anderson stated that about half the engines had been newly rebuilt before the switch to propane. He said, "Engine overhauls have been reduced about two-thirds. Since changing to propane, oil consumption has been cut in half. The trucks can run twice as long because less carbon forms and there is less dilution, sludge and wear. The trucks now have an oil change every four weeks compared to every two weeks before changing to propane. Reduction in oil changes shows a saving of \$151.20 a year."

Coast supplies its fleet of trucks with propane from two 1000-gal. storage tanks, one in Gulfport and the other in Beauvoir. The gas tanks on the concrete mixer trucks hold 55 gal.

and can be filled in just five minutes. This supply lasts the truck all day, which results in considerable saving of service labor. Until the trucks were converted to propane they had to be filled twice a day. Propane is supplied by Blossman Distributing Co.

Coast contracts for big jobs such as the Keesler Air Force base expansion program, but the usual job is medium size, such as pouring the concrete for the new F. W. Woolworth store, Biloxi, Miss. This new building covers 12,750 sq ft.

The area served by Coast Materials is industrial, with jobs running from commercial building and homes to small jobs such as cemetery needs.

Coast records show the following savings for one year since the switch to propane. In 1952-1953 the company saved \$3625.65 on gas. There was a saving of \$151.20 on oil drains, and the saving from pilferage was approximately \$182. This amounts to a cash saving for one year of nearly \$4000 and Coast is completely satisfied with the results of converting its fleet to propane.

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Makes ANY Gasoline Engine RUN BETTER- LAST LONGER- and Cost You LESS!



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THERE are thousands of standby engines in the United States which are kept on hand, ready to run, to supply vital emergency service in case of failure of the electric power supply, to pump water for emergency requirements, or to supply power for rescue and other operations where the normal sources of power are not available. Dependable starting and operation of these engines when needed is of utmost importance.

Typical cases are emergency power

Gasoline Can't Match LPG

As a Standby Engine Fuel

By Carl Abell
Editor

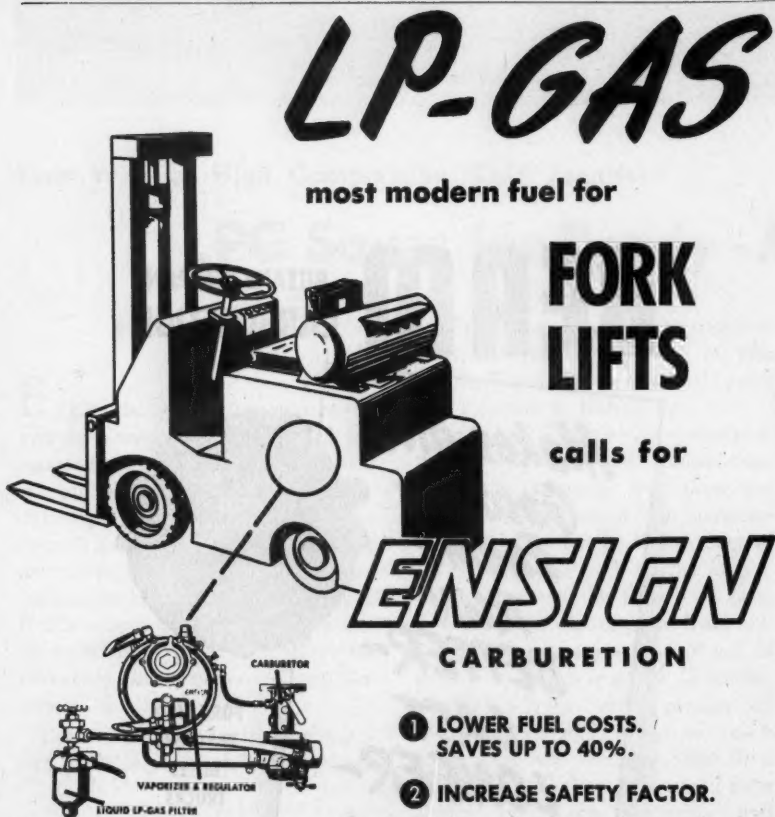
for telephone operations; supplying lights, refrigeration and other necessary services for hotels and resorts;

power for operating police radio stations; lights and power for police stations, emergency hospitals, regular hospitals and other necessary public services; standby power for airports and airway beacons; standby power for microwave repeater stations on communication systems and pipelines; portable pumpers for rural and forest fire protection service; power and water supply for private homes and vacation cottages.

Most of these standby engines are equipped to operate on gasoline, because that is the fuel that is most readily available, and with which most people are familiar. But gasoline is the least dependable fuel for intermittently operated engines, and the one most likely to give operating troubles and result in high maintenance costs.

Gasoline should always be used while it is fresh. Due to the processes employed in modern refining to squeeze more usable products out of a barrel of crude oil and to produce special ingredients having unusually high octane values, modern gasoline has a tendency to form gummy compounds due to oxidation while in storage. Some of the gum remains in suspension in the gasoline, and deposits out in the manifold, on valve stems, pistons and bearings, and in other places where it causes trouble. This is one of the principle causes of high maintenance costs of standby power plants; and no engine can be available for emergency service when it is torn down for the cleaning out of gum.

Gum inhibitors are used in most gasolines to slow down the rate of gum formation and reduce the quantity formed, but in the course of time these inhibitors lose their effectiveness. After gum starts to form in a tank, it acts as a sort of chemical yeast or catalyst to speed up the formation of gum in any fresh gasoline



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- 3 NO SMOKE OR NOXIOUS FUMES.
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- 5 LEADING TRACTORS USE ENSIGN.
- 6 FOR SAFETY USE ENSIGN U L APPROVED CARBURETION.

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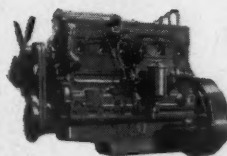
NEW space-saving, high economy, big capacity COE models—3 series, 12 models from 21,000 to 30,000 lbs. GVW—50,000 to 65,000 lbs. GCW. Also available with Sleeper Cab.

NEW MODELS NEW FEATURES

INTERNATIONAL keeps 'em coming... all the time, to do today's truck jobs better, at lower cost!

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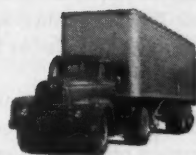
NEW Increased power, with all-new 201-hp Royal Red Diamond 501 engine standard in new high-power-to-weight 220 Series models.



NEW factory-installed 50-inch one-man cab that permits balanced, 2-side loading of steel, lumber, pipe and other longer-than-truck materials.



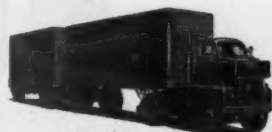
PLUS four-wheel-drive models of 11,000 and 15,000 lbs. GVW—built for lowest cost operation in roughest, toughest terrain.



NEW Super Space Saver **ROADLINER**® conventional truck-tractors that haul all 35-foot trailers in 45-foot limit. GCW ratings, 42,000-65,000 lbs.



PLUS factory-installed, Underwriters approved LPG power, available as optional equipment in 54 models in GVW ratings from 4,200 to 45,000 lbs.



PLUS 10 diesel engines for 30 models. The **INTERNATIONAL** line of 185 basic models offers widest choice of power—30 engines, gasoline, LPG and diesel.



NEW power steering for all models. New light-duty truck features include tubeless tires, optional automatic transmission and overdrive.



NEW multi-stop models with **METRO**® bodies—14,000 to 16,000 lbs. GVW. 10 other models—5,400 to 11,000 lbs. GVW—with **METRO** and **METROETTE** bodies available with new **METRO-Matic** transmission.



NEW **RF-230** 60,000 lbs. GVW six-wheeler added to line of 24 six-wheel models—all with new maintenance reducing, extra rugged rubber-bushed bogie.

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INTERNATIONAL TRUCKS

"Standard of the Highway"

that may be put in the tank. The rate of gum formation increases as the gasoline ages, and also as the storage temperature goes up.

A second drawback with gasoline in standby engines comes from the evaporation of the light ends, which are needed in the fuel to insure quick and easy starting. These starting ingredients are lost through the vent hole in the filler cap, which accounts for the difficulty generally experienced in starting engines that have been out of service for weeks or

months, a condition typical of standby engines as well as tractors.

Propane does not form gum because no oxygen can reach it in storage. Oxygen must be present to produce the chemical reaction which results in gumming. Likewise, the propane retains its starting qualities indefinitely in storage.

A month or a year makes no difference. Propane is always ready to run the engine, and no gumming troubles or dilution of lubricating oil are ever experienced.

Standby engines are not an important volume market, but serving them can be made an important phase of the LPG distributor's publicity and sales promotion program, particularly if he sells and installs carburetion equipment. Whenever a standby engine is installed by any of the public services, the matter is of primary importance to all of the community, so it becomes an item of high news value to the local newspapers, news broadcasters, and Chamber of Commerce.

The fact that the engine operates on LPG because that eliminates the inherent difficulties of gasoline in that type of service, and makes the engine more dependable and less subject to tear-downs for repairs is a related fact of interest to the public. Properly presented to newsmen, this fact will be carried as part of the news dispatch. The conversion of an existing standby engine to make it more dependable is of equally important news value. Another angle is that propane cannot be pilfered for the operation of automobiles.

Pictures of local standby equipment operating on propane can also become a valuable and convincing feature of the LPG salesman's kit. There is no better way known to demonstrate that your electrical competitors' service may fail.

Selling the users of these engines on the use of propane is easy. Most of the small power plants used for these purposes are manufactured by Onan, Koehler, Wisconsin, Lausen, and Waukesha. Factory installed LPG carburetion equipment is available on all of these engines, and the factory approved units may be obtained for making conversions. These are generally vapor withdrawal systems on the smaller engines, making use of standard 20-lb and 100-lb cylinders for fuel supply. These installations are very low in cost.

Some of the larger engines make use of liquid systems, which require domestic or mobile type tanks, and run into more money.

Supplying gas for the standby engines in your community will not make you rich, but it will add to your prestige, help reduce sales resistance, and be of material assistance in getting other business which will run into volume and profits.

NOW




**... You Can Get A
POSITIVE DELIVERY DATE
On Any Order From WESTERN**

Because Western manufactures only custom motor fuel and tractor tanks, you will get a firm delivery date on any order you place. A DELIVERY DATE YOU CAN COUNT ON.

Specify Western and you'll receive the swift, sure service you want plus Western's other features: tanks furnished in appropriate colors; factory design for quicker, easier installation; and larger capacity where possible.



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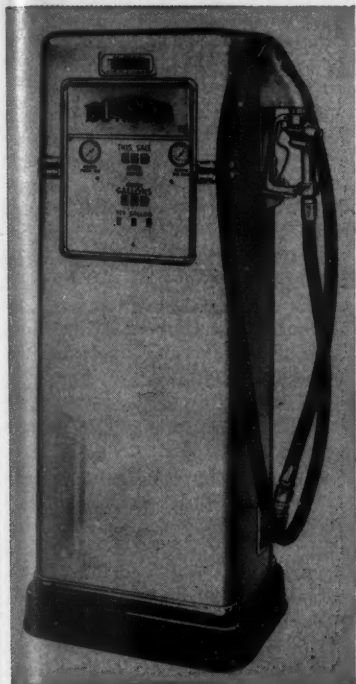
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Power Products

To secure further information on these products, refer to coupon on page 112.

13. LPG Dispensers



An approved dispensing pedestal for butane-propane refueling of L. P. gas-powered vehicles is now ready for production by Bowser Inc.

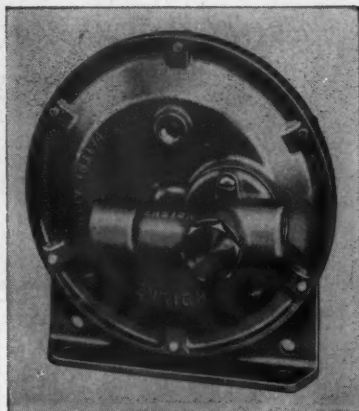
Available in two ratings, 15 or 35 gpm, the metering dispensers are Unwriters' approved. Operating pressure is 250 psi. Working parts of the Bowser Xacto meter incorporated in the pedestal are stainless steel, hard carbon and Teflon.

Safety features of the dispenser make it commercially practical for use by service stations, taxicab fleet operators, truck and bus fleets, and other commercial refuelers.

Bowser Inc.

19. Safety Shut-Off Valve

After four years of laboratory and field development, Ensign Carburetor Co. offers a vacuum controlled automatic shutoff valve for stationary and mobile L. P. gas engine installations. The valve will shut fuel off the instant motor stops, offers posi-



tive protection in case of line leakage, and contains no electrical connections. It is versatile in application and simple in design.

The automatic safety shutoff valve consists of a vacuum controlled diaphragm shutoff valve actuated by manifold vacuum. When the engine is shut off or if the engine fails for any reason, the manifold vacuum ceases and the valve closes instantly. The valve may be installed in vertical or horizontal position.

Only 2 to 6 in. of water column manifold vacuum are required to operate the valve.

Ensign Carburetor Co.

Another Great Engine Builder Selects

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INSTALLED
ON THE NEW
Model 590
HALL-SCOTT
Engine

for power and performance

SUPERIORITY of Century Carburetion is again proved by this acceptance as factory standard for Hall-Scott engines. This new engine develops 245 HP at 2800 RPM and 207 at 2300 RPM (cruising speed) with Century carburetor and M-4S Converter. This is approximately 10% greater than developed with gasoline.

This Century single downdraft carburetor is a metering valve type which is not affected by changes of temperature or altitude. Each carburetor is calibrated and pre-set at the factory to provide a perfect fuel mixture at all times; it guarantees easy starting, perfect idling and constant power and speed in all conditions.

Get the facts, write for complete information today!

CENTURY GAS EQUIPMENT CO., 11188 Long Beach Blvd., Lynwood, Calif.

CENTURY

★ SET IT!
★ SEAL IT!
★ FORGET IT!

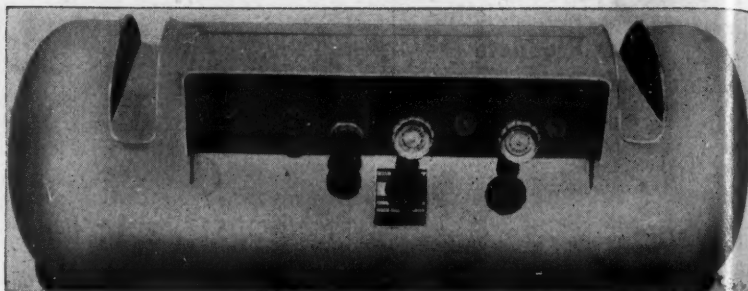


LP-GAS CARBURETION

20. Fuel Tank

A recessed fuel tank, manufactured by Western Tank & Steel Corp., is designed especially for use in General Motors cars. Its special design increases fuel capacity by making use of all the available space above the trunk lid springs.

Different size tanks are available for the different models of GM cars. Western Tank & Steel Corp.



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Butane Manifolds for International "H" & "M," "W9"

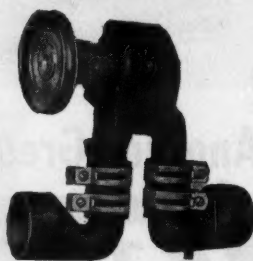
Butane Manifolds for Allis Chalmers "W," "WC," "WA," "WF," "UC" & "MC"

Water Pumps for John Deere Models "G," "A" & "B"

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21. Industrial Unit

High horsepower in the range from 252 to 290 is provided in the heavy-duty Minneapolis-Moline 1600-12A industrial power unit. The unit operates with 12 volts on either natural or L. P. gas.

Dual six-cylinder engines of the MM 800-6A class, mounted in parallel, are geared to a single power take-off shaft. Displacement is 1600 cu in. Bore and stroke are 5 5/16 by 6 in.

Horsepower ratings are: 290 at 1300 rpm, and 273 at 1200 rpm on L. P. gas; 262 at 1300 rpm, and 252 at 1200 rpm on natural gas.

With high compression for low-cost power on big jobs, the new unit is designed for use with irrigation pumps and other large-volume applications, saw mills and cotton gins, generator sets, oil field equipment, and crushers.

The power unit may be obtained with controls and instruments on either side, and with self-contained or externally supplied cooling system. Various available gear combinations provide shaft speeds of 600, 800, 1200, and 1800 rpm with the engine turning at 1200.

Minneapolis-Moline Co.

NOW IS THE TIME FOR MAKING TRACTOR CONVERSIONS TO LPG POWER



One LPG Tractor can equal fuel consumption of 2 or 3 heating installations, so why not let the farm tractor and truck help balance your all-year load?

Tractor conversions with DIX Butane-Propane Carburetion will save your farmer friends 40% to 50% of their tractor operating costs over gasoline fuel next summer. DIX LPG Carburetion will also prolong motor life 2 to 4 times, make motor oil last 3 to 4 times longer, give smoother performance, and unmatched satisfaction.

★ NEW Special Adaptors for all 1955 Chevrolet 6-cyl. and 8-cyl. models. Also

for 1954 and 1955 Ford Truck models. ★ Have you gotten your DIX LPG VIGORATOR? Increases acceleration and economy with constant cool power mixture. Peps up tired, sluggish motor, prevents excessive heating under all temperature conditions.

With a DIX LPG ECONOMETER you see at a glance how motor is performing. Saves fuel—helps spot engine trouble—an accurate engine analyzer.

Don't delay—write or wire TODAY for Dealer Information. Cash in on DIX popularity and increase your year 'round sales of LP Gas.

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Manufacturers of DIX-LPG Carburetors—Simplest of them all!

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22. Carburetion Systems

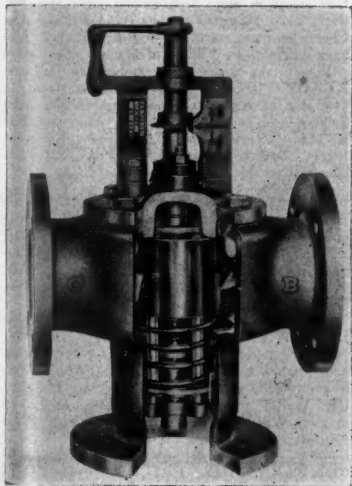
A line of LPG carburetion systems for tractors, trucks and taxicabs has been announced by the Zenith carburetor division of Bendix Aviation Corp.

The systems, more compact and simplified than similar equipment now on the market, feature a unique fuel metering control that equals the best metering characteristics of the finest gasoline carburetion systems, according to the company.

The first regular production units will be for installation on Chevrolets, GMC trucks, International Harvester trucks, and Plymouths. The new unit will provide extra fuel for pulling and full load operation, but the flow of fuel is stopped automatically when the load lightens so that best economy is obtained through part-throttle, or intermediate, speed range.

Zenith Carburetor Division
Bendix Aviation Corp.

23. Temperature Regulator



Temperature regulators containing a new-type thermal element have been developed for use on internal combustion engines and temperature control applications in industrial installations by the Fulton Sylphon division of Robertshaw-Fulton Controls Co. The regulators are supplied with three-way valves.

Changing over from the conventional liquid or gas-filled thermal element, the new regulators (Nos. 1280 and 1281) contain an unusual power-pill unit, which is charged with a solid, wax-like compound. When subjected to heat the special wax-like compound imprisons in the power-pill unit melts and expands, generating an extremely powerful force by

comparison with older thermostatic units. The heated liquid returns to a solid state upon cooling.

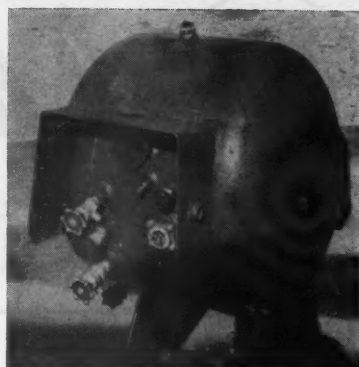
Because they employ the power-pill units, the regulators are insensitive to internal pressures of the system in which they are installed, an important performance factor where systems are under pressure. They are considerably smaller in size and lower in cost than existing regulators for similar applications, according to the company. The regulators contain from one to four power-pill units, depending upon the size of the valves, which are available in sizes ranging from 2 in. and 6 in.

All repairs, replacements of parts, and adjustments can be made without removing the valve from the pipe line, it was stated. Temperature settings are available in the range from 120° F to 190° F in 10 to 15° increments, and may be altered by changing power-pill units.

Sylphon Division
Robertshaw-Fulton Controls Co.

24. Tractor Tanks

A new line of tanks manufactured by the Western Tank & Steel Corp. is illustrated by the Farmall-M factory cross mount.



The tank shown has a capacity of 39 gal., which ordinarily would mean the tractor could work all day without needing refueling.

Western Tank & Steel Corp.

25. Motor Fuel

The J. I. Case Co. has issued a folder, "A4352L," which should be a great deal of help to any LPG distributor wishing to promote the sale of propane as power fuel. This bulletin not only gives an excellent sales story on motor fuel but also devotes the back page to the promotion of propane as an all-around fuel for the farm.

J. I. Case Co.

In Denver, Colorado, its.....	J&S Carburetion
In Mexico City, its.....	J&S Carburetion
In Muleshoe, Texas, its.....	J&S Carburetion
In Minneapolis, Minnesota, its.....	J&S Carburetion
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In Antwerp, Belgium, its.....	J&S Carburetion
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In Memphis, Tennessee, its.....	J&S Carburetion
In Tucson, Arizona, its.....	J&S Carburetion
In Lubbock, Texas, its.....	J&S Carburetion
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In Calgary, Alberta, Canada, its.....	J&S Carburetion
In San Angelo, Texas, its.....	J&S Carburetion
In Kearney, Nebraska, its.....	J&S Carburetion
In Chicago, Illinois, its.....	J&S Carburetion
In Monroe, Louisiana, its.....	J&S Carburetion
In Sweetwater, Texas, its.....	J&S Carburetion
In Chickasha, Oklahoma, its.....	J&S Carburetion
In Dallas, Texas, its.....	J&S Carburetion
In Fresno, California, its.....	J&S Carburetion
In Maracaibo, Venezuela, its.....	J&S Carburetion
In Moberly, Missouri, its.....	J&S Carburetion
In Jackson, Mississippi, its.....	J&S Carburetion
In Moab, Utah, its.....	J&S Carburetion
In Houston, Texas, its.....	J&S Carburetion
In Littlefield, Texas, its.....	J&S Carburetion
In Omaha, Nebraska, its.....	J&S Carburetion
In Skokie, Illinois, its.....	J&S Carburetion

J. & S. CARBURETOR COMPANY
P.O. BOX 10391 DALLAS, TEXAS
"TWENTY YEARS IN GAS CARBURETION"





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LPG BULK PLANTS. WE SPECIALIZE IN petroleum properties throughout Midwest. Have number desirable plants for sale. Additional properties needed. PETROLEUM MARKET-ERS, 605 Produce Bank Bldg., Minneapolis, Minnesota.

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FOR SALE: GROWING BULK AND BOTTLING Gas business in Midwest. About 1800 customers. Two store buildings, located 14 miles apart, one with modern living quarters attached. Five good trucks. Selling because of ill health. Box 1215, BUTANE-PROPANE News, 198 S. Alvarado St., Los Angeles 57, Calif.

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YOU HAVE FOR SALE, WANT TO BUY OR TRADE OR FIND — you can do it quickly, easily, with a B-P News classified ad.

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A COMPANY SEEKING A BRANCH MANAGER AND A SALESMAN got 38 replies from one ad in the classified columns of BUTANE-PROPANE News... THE PLACE TO ADVERTISE FOR WHAT YOU WANT.

HELP WANTED

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LP-GAS SALES SPECIALIST

Leading marketer of LP-Gas has opening for experienced carburetion specialist for sales promotion and service. Must be familiar with all phases of LP-Gas utilization in internal combustion engines. College background preferred. Willing to travel. Write in full confidence all details. Box 1235, BUTANE-PROPANE News, 198 South Alvarado Street, Los Angeles 57, California.

FOR SALE — MISCELLANEOUS

DECALS MADE FOR TRUCKS, EQUIPMENT. Small or large quantities. Catalog free. Mathews Co., 827 S. Harvey, Oak Park, Ill.

FREE FREE FREE

With purchase of six (6) "Leak Detecto Brushes" at \$3.75 each, Free: one gallon Detecto Solution. For limited time. Gas Appliance Stores, Inc., Box 5057, Columbia, S. C.

FOR SALE: PIPE THREAD COMPOUND. Due to a special purchase we can supply you with a quality compound at a real savings. 25¢ pail only \$6.25. 100# or more prepaid. Cash, no C.O.D. SOUTHWEST GAS EQUIPMENT, Liberal, Kansas.

FOR SALE—IMMEDIATE DELIVERY! Eureka Smokehouse Burner Assemblies! For meat smoke houses using bottled gas. Completely automatic. Clean filtered smoke. Distributes heat uniformly. Low gas consumption. Automatic temperature and pilot control. Less product shrinkage. Easily installed. Write for descriptive pamphlet. Eureka Equipment Company, P. O. Box 396, Beloit, Wisconsin.

FOR SALE—BAKER HYDRAULIC ALCOHOL pumps for injecting alcohol into propane-butane cylinders—against pressure. Only pump of its kind. Chosen by leading LP-Gas servicemen throughout the world. Sure cure for moisture trouble. Cost so little, saves so much service. Equip every truck with one. Send check or money order (No C.O.D.) for \$44.95 to Baker Engineering, Malone, N. Y.

FOR SALE: 100 - 2521T BASTIAN-BLESSING manual throw over valves @ \$4.00 each. Will ship prepaid. BUTANE-PROPANE SERVICE, INC., HOLYOKE, COLO.

FOR SALE: 6,000 GAL. PROPANE TANK, 1 year old. Painted with aluminum paint, like new. Paid \$2,800, sell \$2,000, F.O.B., Matthews. W. A. Gemeinhardt Seed Co., Matthews, Missouri.

(20) ALGAS V1403 L. P. CARBURETORS, \$13.50 each; (2) V1404 Algas L. P. Carburetors, \$13.50 each; (20) 1500E Converters, \$30.00 each; (20) 670 Filters, \$5.00 each; (8) 609A Adapters, \$1.00; (2) 609B Adapters, \$1.00 each; (11) Vehicle Tanks, 45 gal. capacity, \$50.00 each; (2) 1" x 25' L.P.G. Hoses with fittings, \$25.00 each. All above equipment new in original cartons. MANKATO CITY LINES, INC., 126 Lamm St., Mankato, Minnesota.

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568-52 & 568-55

Fan & Limit 70-250

566-28

Fan 70-175 Limit 70-250

Full Specifications on Request

The Buckeye Incubator Co.
Mt. Vernon Avenue
Springfield, Ohio

FOR SALE — TRUCKS - TRAILERS

TRINITY'S NEW EXCLUSIVE MODEL #106 with sectional skirting - 1700 WG capacity W-250 - ICC MC-330 complete with pump, printometer, remote Okadee valves, clutch, power take-off and throttle. Completely installed on new factory LPG powered RP-162 International chassis. Immediate delivery, \$5,100.00 F.O.B. Trinity Steel Co., Inc., 3301 S. Lamar St., Hunter 8321, Dallas, Texas.

BUYING YOUR FIRST DELIVERY truck tank? Get the facts on Trinity's New Model #104 Twin 1400 WG capacity 250# WP complete with pump, printometer, hose, plumbing, etc., installed on new 1954 135 HP Chevrolet chassis—ready to haul gas today—\$4,300.00 F.O.B. Trinity Steel Co., Inc., 3301 S. Lamar St., Hunter 8321, Dallas, Texas.

NEW: IMMEDIATE DELIVERY, 1400 WG U69 propane extra lightweight twin barrel delivery unit. Mounted on new 1954 2-ton, 2-speed Chevrolet truck with big engine. Fill and vapor hose assemblies—Viking Mechanical Seal Pump —Power take-off assembly and motor fuel tank. READY TO GO FOR \$3970.00 tax paid. Also available at low extra cost: meters, fire extinguisher and L. P. carburetion. American Tank & Manufacturing Co., 2136 West Commerce Street, Dallas, Texas. P. O. Box 5525. Telephone Riverside 9183.

1—3636 WATER GALLON PROPANE transport, U-69 construction, 200 lb. working pressure. Manufactured by Columbian Steel. Painted white enamel. Good 1100x20 tires. Entire unit first class condition. Price \$2,500.00. Washington County Butane Co., Phone 1346, Bartlesville, Okla.

USED INT. L-162, 2 SPEED AXLE, PROPANE carb., heater with BRAND NEW, Model 100, 1400 W.G. twin PROPANE TANK. Truck in good shape with 34,000 miles. Only \$2,375.00. Can plumb to your specifications at regular prices. White River Distributors, Inc., Phone 570, Batesville, Ark.

COMPARE OUR PRICES: 1955 2-TON Chev., big engine, 2 speed axle, 825 rear tires, piped complete with Viking mechanical seal pump, P.T.O. shaft, Model 100, 1400 W.G. twin PROPANE TANK, 50 ft. hose, painted with lights, ONLY \$3,875.00. Same equipment on 1955 International RP-162, factory equipped for L.P.G. Only \$4,085.00. White River Distributors, Phone 570, Batesville, Ark.

1800 W.G. TWIN PROPANE TANK WITH large, deluxe cabinets on each side, mounted on 1955 Int. RP-172, 2½ ton, with BD-282 over-size, factory equipped for L.P.G. engine, Viking mechanical seal pump, 50 ft. hose, painted with lights, and piped complete, ONLY \$5,095.00. Meters, hose reels and other extra equipment available at attractive prices. White River Distributors, Inc., Batesville, Ark. WE SAVE YOU MONEY.

BUYING YOUR FIRST DELIVERY TRUCK? We can save you money—give you immediate delivery—finance on easy terms with no red tape—and give you many money saving ideas on the operation of your bulk deliveries. Let our many years of experience in the L. P. Gas business help you. 5 Models to Choose from: 600 to 2,400 W.G. twin or single barrel. White River Distributors, Phone 570, Batesville, Ark.

FOR SALE—TRUCKS-TRAILERS - Cont.

SPECIAL: AMERICAN "BETTER-BILT" extra lightweight 1500 water gallon U69 propane twin barrel delivery unit, with Viking Mechanical Seal Pump—Neptune Print-O-Meter—fill and vapor hose assembly—mounted on new 1954 2-ton, 2-speed GMC chassis with 8.25 tires —READY FOR SERVICE. PRICED AT \$4475.00 tax paid FOB Dallas. Other sizes available at comparable low cost. American Tank & Manufacturing Co., 2136 W. Commerce Street, Dallas, Texas. P. O. Box 5525. Telephone Riverside 9183.

FOR THE BIG HAUL . . . NEW 1800 WG U-69 NOR-TEX twin delivery unit. Equipped for service with trim skirting, 50-gallon recessed fuel tank, ICC lights, Viking mechanical seal pump, P.T.O. and splines jack shaft. Mounted on brand new factory LPG powered International RP-172 chassis with the big 282 LPG engine. 5th overdrive transmission, two speed axle, 9:00 tires all around, heavy duty rear springs. All ready to start delivering gas for only \$5,125.00, including taxes, F.O.B. Denton. Call NOR-TEX PRODUCTS COMPANY collect, C-5416, Denton, Texas.

REAL SAVINGS ON COMPLETE PACKAGE UNIT FOR IMMEDIATE DELIVERY. 1400 WG U-69 twin delivery unit with trim skirting, mounted on new 1954 factory LPG powered International, RP-162 chassis. Two speed axle, 50-gallon recessed fuel tank, P.T.O., splines jack shaft, Viking mechanical seal pump, 50' filler hose and ICC lights. Painted gleaming aluminum over red oxide. Ready to start making you money for only \$4,085.00, including taxes, F.O.B. Denton. Meters, fire extinguisher and cabineting available at low extra cost. Call NOR-TEX PRODUCTS COMPANY collect, C-5416, Denton, Texas.

USED CHEVROLET, 2-SPEED, 2-TON, 1948, with 1200 W. G. Propane Tank, all gas carburetion, Viking Pump, operating now. \$2,050. Also GMC 1946 1½ ton, 2 speed with 736 gal. tank, propane carburetion, Viking Pump operating now, 1,050. Meter extra. Hank's Propane, Atchison, Kansas.

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1 5500 gal. 250# W.P. Twin New
1 5000 gal. 200# W.P. Twin Used
1 5400 gal. 117# W.P. Twin Used
1 5600 gal. 250# W.P. Twin Used
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Lubbock Machine & Supply
P. O. Drawer 1589
Lubbock, Texas

FOR SALE—TRUCKS-TRAILERS - Cont.

FOR SALE—1948 KBS 1450 W.G. U69 EN- sign Neptune Meters. 1948 KB-8 3-Speed Brownlite 1950 W.G. U-69 SLICK. George Self Butane, Ponca City, Oklahoma.

FOR SALE: 1500 GALLON PROPANE DEL- ivery tank with new mechanical Seal Pump and Print-O-Meter, complete with hoses ready to go. Will fit 102 cab to axle chassis. Schuyler Propane, Schuyler, Nebraska.

FOR SALE—TANKS FOR TRANSPORT OR STORAGE. (1) 3168 water cap. 250 lb. press.; (1) 3300 water cap. 250 lb. press.; (1) 3830 water cap. 250 lb. press.; (1) 3976 water cap. 250 lb. press.; (1) 6108 water cap. 250 lb. press. Mounted on 33' 1945 Callahan 2 Axle Semi-trailer, equipped with 100 GPM Smith pump, 5 H.P. Exp. Proof motor and 100' cable. (4) 1958 water cap. 125 lb. press. Spheres mounted on 35' 1946 Pike 2 Axle Semi-trailer. Will sell Tanks with or without Trailers. ALLYN TANK LINE, 14011 So. Central, L.A. 59, Calif. Phone Nevada 6-1871.

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BETTER BUSINESS RECORDS IN- crease your profits! They help improve your credit. In fact—good records actually help boost sales. That's one reason why KRAFTBILT LP-Gas forms are used by more dealers than any others. Simplify your office work—use KRAFTBILT simplified forms. Approved by your Association. Highly recommended by outstanding suppliers. Don't wait! Send postcard now for LP-Gas Forms Catalog. ROSS-MARTIN CO., P.O. Box 800-S, TULSA 1, OKLA.

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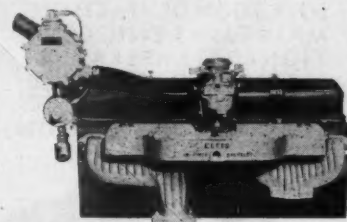
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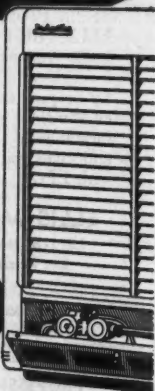
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WINTER AIR CONDITIONER

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FOR ALL GASES

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TRAVELS HEAT FARTHER FASTER

- FAN-FORCED circulation for balanced heat, floor to ceiling, A.S.A. approved, all gases, high altitudes.
- FULLY AUTOMATIC. Safety Pilot, thermostat Temperature Control and Fan Switch. (Manual Summer Switch.)
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